SUBROUTINES

Volume 5, Number 1
January 1986

David Bunnell's Newsletter from
Inside the Personal Computer Industry

PC Revival Meeting Held in Palo Alto, CA

A Curious New Trend

I recently attended an industry outlook conference in Palo Alto sponsored by Technologic Partners, publisher of the *Computer Letter*. An assortment of industry nabobs, moguls, pundits, and gurus convened in all-day panel discussions at Rickey's Hyatt House to discuss future trends and opportunities in personal computing. But it was more of a communal pulse-taking and back-slapping session than a revelation of things to come.

This has become somewhat of a trend in itself. Once there were too many trade shows. Now there are too many seminars and conferences at which industry leaders predict the future.

Borland President **Philippe Kahn**, the ebullient maverick and irrepressible gadfly of the industry, may have had a point when he said, "We should charge people to speak at panels like this."

Meanwhile, **Bill Gates** also noted the curious trend of mood reading in the computer industry: "The industry has become very introspective. I went to two panels in Las Vegas [at COMDEX '85],

> *"The retail market is a zoo. It has always been a zoo. You won't make any changes there."*
>
> —John Roach, President and CEO, Tandy Corp.

and everyone was asking, 'Who's optimistic?' It's as if people are making judgments based on their emotions."

Beating a Dead Horse

No one wants to talk about copy protection anymore. We all know it was a big mistake—that software publishers screwed up. As Ashton-Tate President and CEO **Ed Esber** said at the conference, "The whole industry deserves an F for doing a superior job of getting in the way of legitimate users and an inadequate job of getting in the way of pirates." All emotion is gone from the issue because we beat it to death.

Distribution Questions

Seymour Merrin, Senior VP of the Gartner Group, moderated for the panel on retail distribution. The panel members were **Dave Norman**, President of Businessland; **Ed Faber**, newly appointed Chairman of ComputerLand; and **Avner Parnes**, Chairman and CEO of the Maryland-based MBI Business Centers. All looked grim, as if they were sitting in on a session of the Soviet Politburo.

Merrin did not warm any of their hearts when he pronounced, "The distribution channel is bankrupt. This is not a new industry. These are new products in the world's oldest industry."

Merrin then recalled the Pearl Harbor of personal computing—May 1984. "Out of the dust came the

Godzilla of economics, when supply exceeded demand. Then IBM dropped its prices and created a new law of economics, known as negative elasticity."

Finally, Merrin posed the unfathomable question: "It's 10 o'clock. Do you know where your receivables are?"

There was a great deal of chest beating and contemplation of navels over problems in the retail distribution channel. I think the issue is fairly straightforward myself. On the one hand, you have someone like Avner Parnes, who announced at the conference that his regional distribution company, which operates between Boston and Washington, D.C., has had 13 consecutive profitable quarters since August 1982.

Avner said, "For me the number one concern is making a profit. Technology comes afterward. I concentrate on business and government users. I have no interest in the home market. The name of the game used to be opening new centers. Now it's acquiring new centers."

Then there are the retail turkeys—those who are doomed to go out of business.

By shrewdly concentrating on regional distribution, **Avner Parnes** has done well for himself. He made an interesting demographic discovery about his clientele: "The average woman customer earns $51,000, and the average man earns $46,000."

Let 'Em Eat Software

Retailers have said that they have been suffering since 1975. Nothing new about that lament.

It was ironic to note, therefore, the way in which the sentiments of the attendees swung back and forth about the plight of the retailers. Earlier in the conference, software publishers were talking about how they might assist retailers—by stationing their own salesmen in the stores, giving back part of their profit margin, awarding individual salesmen financial incentives for selling their packages, doing more co-op advertising, and so on.

> *"The number one concern is making a profit. Technology comes afterward."*
>
> —Avner Parnes, Chairman, MBI Business Centers

Then **John Roach**, President and CEO of Tandy Corp., stood up and said, "It won't make any difference, because the retail market is a zoo. It has always been a zoo. You won't make any changes there. The changes will all be marginal anyway."

Right after this sage pronouncement, **Del Yocam**, Executive VP and Group Executive for Product Operations at Apple Computer, gave his testimony: "We have been trying all these things to create order in the distribution channel all these years, and it never happened."

Suddenly, the mood of the crowd changed. The new consensus in the room seemed to be, "Screw those guys, they are just going to go out of business, and we can't do anything about it."

No More Tears

Dave Norman didn't hanker to the dour prognosis about the distribution industry. He cited a Dataquest chart showing the projected growth of the market, noting that in 1984 alone there was a 91 percent growth rate (see Figure 1).

Other Norman notions: "Starting in '86, we will start to be connected much more. IBM's Token-Ring standard will be like the PC-DOS standard. This is the office of tomorrow—in '87 and '88. We will see the first connection of PBXs to mainframes. In '87 there will be a clear emergence of cost-effective integrated voice data connections, with application software that will enable us to communicate and that will drive the industry."

Ben's Theme

During the question-and-answer session on retail distribution, after the panelists had their say, venture capitalist and Compaq Chairman **Ben Rosen** posed the following questions: "What opportunities are there in the marketplace? What can venture capitalists do to back their companies? And will distributors offer shelf space?"

"In '87–'88, cost-effective voice data is going to be a reality," predicted **Dave Norman**. "We're interested in looking at the real high value state of

the art," responded **Ed Faber**. "No comment," said **Avner Parnes**. When you don't have one, you just don't have one.

Still in the Back Rooms

"Speaking rationally to an irrational person is an irrational act," **Bill Gates** noted about the chronic state of confusion in the distribution arena. "The problem of distribution is like traffic," he said. "One person can screw it up for everybody."

Gates offered a partial solution. He suggested that there are two kinds of software customers: those who do not need support and those who need it but should be charged for it.

"It's like buying a car," he said. "You can buy 50,000 miles and a service agreement. Some want to fix [the car] themselves, but the average shopper does not know how to drive."

From the audience, **Philippe Kahn** retorted: "Do you think people who drive 45 mph in the fast lane know how to drive?"

Bill Gates' speech was the best one at the conference, because he is working in so many different areas and on a number of levels. He is in tune with what is happening with technology and the market, and he is very thoughtful.

"We have flushed out the hackers from the system," said Software Publishing President **Fred Gibbons.**

Instead of having hackers, engineers, and creators running companies and deciding what new products and innovations to implement, you have MBAs charting the course of the industry. We are bound to miss out on some worthwhile breakthroughs.

But it is a fallacy to think that the creative thinkers have been flushed out of the system. They are still around. They are just in the back rooms—that's where it is still happening.

A Lighter Note

Industry evangelist **John Roach** made spirits soar with a no-nonsense sermon at the Technologic luncheon. He predicted that personal computer sales will increase by $4 billion in 1986. That is a 34 percent increase in sales to a total of $19.1 billion, as the number of PCs sold jumps to 9.2 million from 7.3 million this year. Hardly the sign of an arteriosclerotic industry.

Subroutines wanted to follow up with John Roach after the conference, so we dialed the main Tandy Corp. number in Fort Worth, Texas. The switchboard operator put us through to his office, and to our great surprise Roach answered the phone himself.

"I always answer my own phone if I am sitting here, because I don't like to call people back," he explained.

The Right Stuff in '86

"This could be a good year for manufacturers who have the right product and the right plan behind the product," Roach said. "Some of the clone manufacturers, along with IBM, have the prospect of having a good year.

"For the large businesses, just how good a year it will be will depend on an external factor—how well the

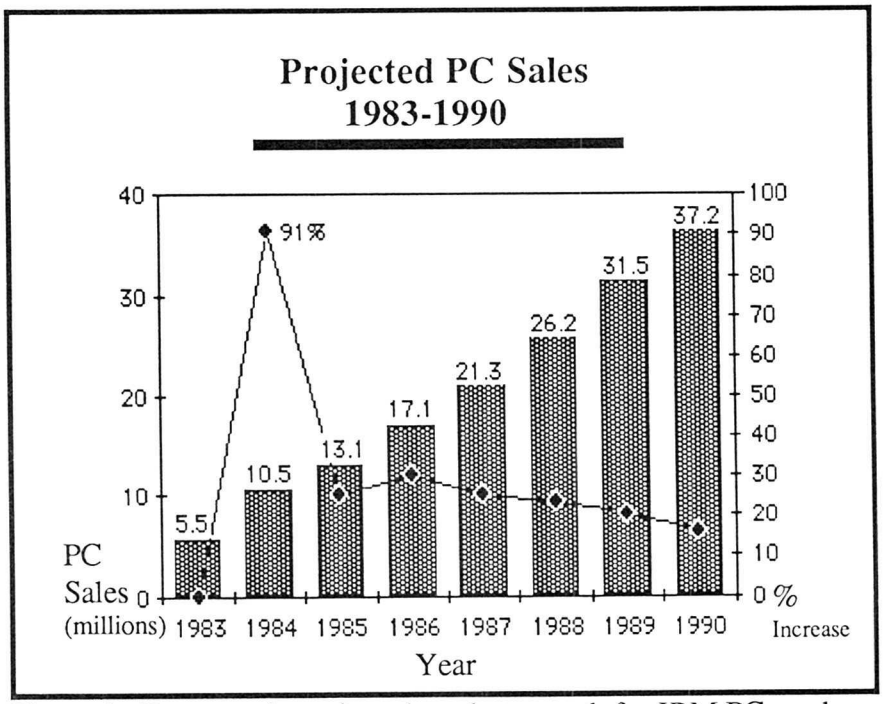

Figure 1: Dataquest's projected market growth for IBM PCs and compatibles, including XTs and ATs.

economy does, which in turn will affect the spending of those big businesses.

"Small businesses are always in need of productivity tools. It should be a good year in that market.

"As for the education market, this will be a good year, with people buying primarily Apple and Tandy machines. There is a home market, but it is changing. There is less interest in the computer literacy machines and more interest in machines that have added utility and performance for the home.

"The pricing in the industry will continue somewhat as it has in the past. Give users better price performance. The only way that the industry is really going to show growth is by moving customers to higher performance machines. The existing price points within, say, the PC, the XT, and the AT will continue moving down as they did in 1985."

Big Blue's Blues

Roach continued: "I just have to assume that IBM is not terribly happy with the way the market is evolving. They are obviously trying to shift—possibly to an even greater business orientation—and that is probably working reasonably well.

"The relationship with their computer stores, the financial integrity of their computer stores, and the lack of success on the low end of the line, particularly in the home and education markets, has to be a problem—if they have an interest in that part of the market."

The Born Again PCjr

"As far as I know, the advertising we have seen for the PCjr is an attempt to try to liquidate the inventories that dealers have or that IBM has,"Roach said. "It is amazing to see a product that has been discontinued then be advertised as if it were a continuing product. It is unusual, but I am sure that they [IBM] can argue that people sell discontinued merchandise all the time without telling the consumer that it is going to be discontinued. Therefore, they are more honest than the average advertiser, right?"

> *"There is a degree of optimism about '86 that differs markedly from the so-called slump perception. It is going to be a good year."*
>
> —Ben Rosen, Chairman, Compaq Computer Corp.

Technologic Takes

"Nah, there is nothing interesting [at the conference]. . . Just people presenting their own world views: the world according to Compaq, the world according to Apple. . ."—**Deborah Wise**, *Business Week*

"Terrific. There is a degree of optimism about '86 that differs markedly from the so-called slump perception. It is going to be a good year. [The conference] also highlighted the fact that a lot of new companies have entered the field this year and are getting distribution and sales. The reports of industry deaths are all greatly exaggerated." —**Ben Rosen**

Overheard during a break was **Bill Gates** engaged in an esoteric technical discussion with AST Research President **Safi Quereshey** about *Windows* working with LANs: "Do you understand what I'm saying or not?"

"I'm enjoying the breaks." —**Marty Alpert**, President, Tecmar

"I'm glad to see that people are not dead," remarked Nestar President **Harry Seal**. "The press should be taken to task for writing about how the entire industry responds only to short-term pressures. I don't know about the rest of you, but I'm doing well."

Esther Dyson, editor of *Release 1.0*, was seen listening to the proceedings while reading the *Wall Street Journal*. Ashton-Tate President **Ed Esber** was sitting a few rows away with his briefcase open, shredding documents.

Symantec President and CEO **Vern Raburn** was occupied at the luncheon with *USA Today* reporter **Kathy Rebello**, but he did take time out to make a prediction: "I think [Aldus'] *PageMaker* will be the next *VisiCalc*. It will be to desktop publishing what *VisiCalc* was to spreadsheets."

Philippe Kahn quipped as moderator and venture capitalist **Steve Dorr** flashed a slide showing a Compaq computer used in a hospital operating room. "Is that computer sick?" he asked. Vern Raburn said after the fact: "If that was a sick computer, it must have been a Mac."

"What is the next product going

to be?" wondered **Bert Nodin,** President of Digital Communications Associates, during the panel discussion entitled "Making Connections: Desktop-to-Desktop and Beyond." His prediction: "Instead of individual PCs connected to the mainframe, it's going to be through clusters of PCs to the mainframe."

A bemused observer said: "I think these network people are living in a fantasy land."

Lunchtime Tidbits

I was sharing a table with the affable **Ed Juge,** Director of Market Planning at Tandy Corp. and **Vern Raburn,** whose company, Symantec, had just distributed complimentary copies of its new *Q&A* integrated software pack-age to conference attendees. Said Ed as he settled into his seat: "Now the question is whether it will run on my Tandy 3000."

Noting that Compaq claimed at COMDEX that it sells a machine every minute of every business day, Ed said, "If these figures for Compaq are right, we are outselling them by a wide margin. John [Roach] feels we may even be outselling the IBM PC on the retail market."

About the possibility of IBM bringing out its own lapsize computer, Ed said: "The question is whether it will legitimize that market, or do people really need that much horsepower in a machine that is portable?"

On changing fashions: "I remember seeing **Vern Raburn** when he was dressed kind of like **Philippe Kahn** is now. I almost didn't recognize him." Vern was wearing a fashionable but conservative beige suit and a tie. Philippe's attire is decidedly off-Champs-Elysées: open-neck sports shirt and scruffy slacks.

Dan, Where Are You?

It seemed that everyone who is anyone was at the conference, so *Subroutines* looked for people who were not there. **Mitch Kapor, Adam Osborne, Dan Fylstra,** and anyone from **IBM** were among the notable missing persons.

Everywhere I go someone asks about Dan Fylstra. Dan, who was the chairman of VisiCorp [the company that marketed *VisiCalc*], was once the king of the software industry. His position was very similar to that of Bill Gates and Mitch Kapor today. But VisiCorp bit the dust, and Dan seems to have disappeared. I noticed that he was registered to attend the conference, but he didn't show up. If anyone knows where he is, please let me know.

Esber's Myths

The following are some of the industry myths that **Ed Esber** of Ashton-Tate would like to see shredded, or at least shed:

- The myth of the suggested retail price.
- The myth that integrated software is dead.
- The Lotus syndrome myth.
- The Philippe Kahn syndrome: "If you lower the price, you make it up in volume."
- The myth that you cannot learn anything from mini or mainframe companies because the micro is different.
- The myth that the MIS manager has lost power.
- The myth that the customer always wants more features. Ed related that when he was at VisiCorp, he wanted to come up with useless features for one of their products just to advertise that competing products didn't have them.
- The myth that the computer is a panacea. It makes a bad manager worse faster and a good manager better faster.

Parting Predictions

Is Philippe Kahn of Borland going to be to software what Adam Osborne was to hardware, or will he continue with his unorthodox and wild success story?

"His diversity is going to save him," observed **Ed Juge.** "Adam set out to prove to the world that they are ignorant idiots. Philippe Kahn set out to make money. He's enjoying his notoriety."

But did Kahn like the conference? "It's great fun. John Roach was great. I'm gonna come back next year," he promised with a wink.

Faber's Solution

Ed Faber reintroduced himself to the audience after his three-year exile from the industry and his recent assumption of CEO powers at ComputerLand, by joking, "I retired the Air Force." He was referring to retiring the ComputerLand executive jets as well as making other cutbacks to reduce overhead.

Then he expressed his views about the future: "Solutions selling holds the promise of the future," he said. Spe-

cifically, he cited "discounted solutions selling, characterized by light or premium prices—offering fully developed technical or specialized solutions to vertical problems."

Faber concluded with a rather startling remark: "The gray market out there didn't just happen. I'm not so sure that they are not products or some kind of product [in themselves]."

Hawkins' New Trip

Electronic Arts President **Trip Hawkins** is one of the more eloquent, thoughtful, and original thinkers in the industry. Listening to him is like glimpsing the nuts and bolts behind a cohesive vision of the future. He is a very practical sort of visionary.

"Our presence here is evidence that despite the efforts of microcomputer manufacturers to kill the home market, they have only managed to cripple it," he joked. Hawkins was part of a panel of home computing folks who included Broderbund President **Doug Carlston** and Activision President **Jim Levy**. Their theme was: "If the home market does not exist, why are some companies making money in it? Can they keep it up?"

Has the home computer software market gone soft? It is relatively small but profitable, according to Hawkins—"$25 to $30 million this year."

The big challenge is redefinition—rediscovery—of the home market, Hawkins believes. The generic term "home computer" has received such a raking over the coals, thanks to companies like Atari and Commodore, "who have screwed up the market," that it is time to reinvent the home computer.

Hawkins calls his new marketing concept the AVC—the audiovisual computer. It is dedicated to a new dimension in entertainment and learning, Hawkins says. "Most people do not want to take their work home—they are ready for Miller time."

> *"The ultimate goal is to magnify human experience with sound, vision, and information in an interactive environment."*
>
> —Trip Hawkins, President Electronic Arts

"Until now we have been focusing on increasing the computational power of computers," Hawkins noted. Then he said that the common link of all other electronic media in the home is to "take some part of life and put it in a box," be it music, or images on a television.

But these are all passive media. They do not challenge the little gray cells. The ultimate goal is to magnify human experience with sound, vision, and information in an interactive environment. Until now, none of these media—neither the entertainment media, nor the common 8- or even 16-bit computers—have the necessary technical power to suspend disbelief.

That is what the AVC will provide—and Hawkins believes that the coming revolution in CD-ROM drives and disks will make the transition from home computing to truly cerebral computing possible.

"How many of you right now either have some sort of physical program, jog, play some sport or another—or feel guilty about the fact that you don't?" Hawkins asked rhetorically.

If you care about your physical fitness, you have to care equally about your mental fitness, Hawkins believes. After all, medical research in recent years has shown that if you don't use it, you lose it.

"The computer may be the key to unlocking the mental potential of this country and the world if we can get people to start using their brains a little more—because they have an exciting new medium to do it with. That is the potential of home computing. What I am pushing for right now is to make that happen as rapidly as possible. And I would like to see you get on that bandwagon and support that viewpoint."

Subroutines is published by PC World Communications, Inc.
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An annual subscription to *Subroutines* is $195 (outside the U.S. add $25 for postage). Direct all communications to *Subroutines*, 555 De Haro St., San Francisco, CA 94107, 415/861-3861.

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Born Again!

The Continuing Saga of Apple's Macintosh

The recent Macworld Expo, which ran for three busy, intense days in San Francisco's Brooks Hall, marked the rebirth of the Macintosh market. I sat resting my feet behind the curtains that constituted show organizer Mitch Hall's private office deep inside the Expo's mission command center. Phones were ringing, Apple software evangelist **Guy Kawasaki** (rumored to be **John Sculley**'s choice to head the company's newly announced venture capital unit) was passing through, and there was a telltale clue, a Cuban cigar the size of a crow bar, on Mitch Hall's desk, a sure sign that IDG Chairman and CW Communications mogul **Pat McGovern** had recently paid him a visit.

As I took the load off my feet, I reflected on the positive press that the Macintosh and Macworld Expo had both received. Apple now had a new machine–the 1-megabyte Macintosh Plus. It had reported higher than expected earnings, the dispute with **Steve Jobs** was finally settled, and everything looked rosier for Apple than it has looked in a long time.

The days of a cynical press always on the lookout for bad news about Apple should now be over. And compared with Apple's 1985 annual meeting, which was a Steve and John Show with Sculley overshadowed by Jobs, the 1986 AppleWorld Conference, which kicked off Macworld Expo, was an upbeat but relatively restrained affair.

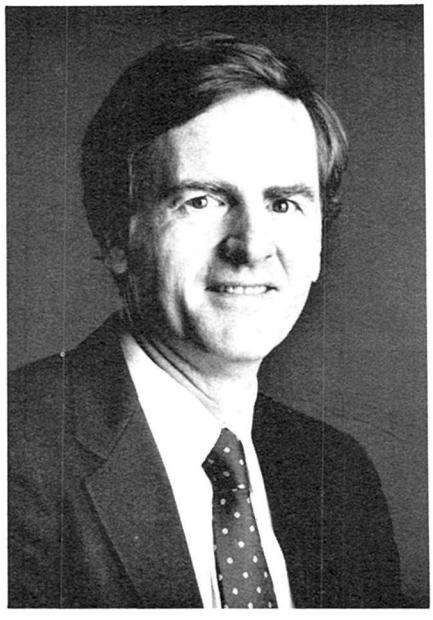

Photo courtesy of Apple Computer, Inc.

> *"We want Apple to be the most exciting, market-driven, technology-based company in the world."*
>
> —John Sculley, Chairman President, and CEO, Apple Computer

In retrospect, Jobs was the more technology-driven ego of the pair. Now with the more solid Sculley at Apple's helm, there won't be any more jousting at the IBM windmill. Apple has carefully targeted its marketing opportunities for the next five years–desktop publishing, desktop productivity, and desktop communications–and I predict that the company will do well. Maybe.

The Maybe Factor

It was a replay of the Roman games, only this time the Christians were eating the lions. As it turned out, the keynote presentation at Macworld Expo, "The Macintosh Today and Tomorrow," was actually a misnomer. No one from Apple was present to discuss the new directions of the Macintosh, panel members were singularly grumpy about the Mac's future prospects, and the frenzied audience was in no mood to entertain nay-sayers.

Nevertheless, it was an extremely eye-opening event, because it underscored a rather sharp schism

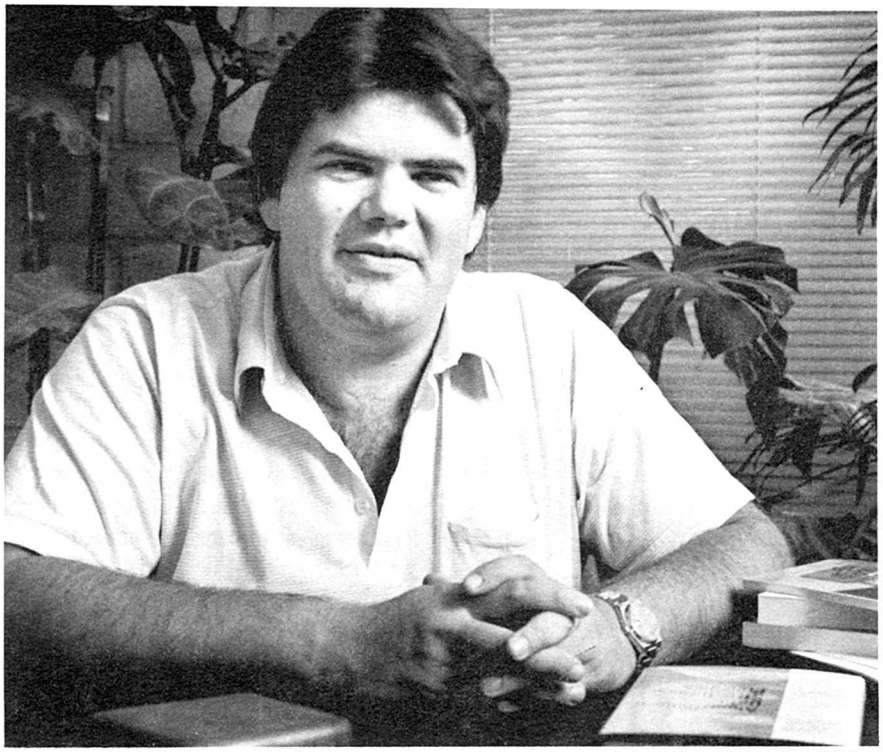

Photo courtesy of Borland International

"When the Mac came out, I was the only developer who said it was a piece of shit."
—Philippe Kahn, President, Borland International

within the Apple world.

The lions, the market analysts, had their own ferocious view of Apple's struggle for a market share against the dark forces of MS-DOS. They took Apple to task for its fickle marketing policies of the past and questioned the depth of its commitment to the Macintosh in the future. The third-party developers on the panel bemoaned the Mac's inadequate installed base as a factor that not only inhibited their success, but also threatened their survival.

As Borland International President **Philippe Kahn** noted, the figure of 500,000 Mac users (a far cry from Apple's original projection of 1.5 million owners by the end of 1985) is deceptive, because there are only 200,000 active business users who could constitute a serious buying market. Kahn pointed out that Apple has sold a ton of Macs to university students. According to Kahn, college students are too poor to buy software–they steal it.

Meanwhile, the Mac zealots in the audience felt confused and betrayed because the panel members were telling them that Apple had forsaken them for the more lucrative business market.

"The present management of Apple has basically lost its interest in people like you," warned Kahn. "They are more interested in selling to MIS directors, and in the process, they are going to abandon what has been one of the major sources of competition and innovation in the industry."

Back to the Future

In a moment of weakness, Kahn noted that he was happy to see Apple moving to open up the Macintosh architecture. An earlier introductory remark was not quite as endearing, however: "When the Mac came out, I was the only developer who said it was a piece of shit."

Now Kahn lauded Apple's change of heart and commented: "It's really tough to hope to sell to businesses when Apple ads show businessmen falling off a cliff."

Meanwhile, at another session at Macworld Expo, Apple software evangelist **Guy Kawasaki** teased the audience: "You thought we weren't going to advertise in Super Bowl '86. Well, you're wrong."

Kawasaki ran a repeat of last year's "Lemmings" commercial, except for one thing: It was shown backward.

Deja Boo

"I find myself today fearing I would be in the position of Yasser Arafat at a Bar Mitzvah," said **Will Zachmann**, Vice President of Corporate Research

for International Data Corporation of Framingham, Massachusetts, as he addressed an unsympathetic crowd.

Zachmann noted that although Apple had been a leading innovator two years ago when the Mac was first introduced, it has become "a relatively standing target. With things like Digital Research's *GEM* and *Microsoft Windows* on the IBM PC, the gap between what the Mac provides and what the rest of the IBM PC world has is narrowing dramatically. The 1-megabyte Mac Plus and 800K double-sided drive bring the Mac to where it ought to have been a year ago.

"Apple has increased its earnings, but it has done so by downsliding and controlling costs," Zachmann continued. "Macintosh software developers are not making money. I see a real risk of the whole thing being lost if Apple is not very careful and doesn't make the right moves, evidence of which is lacking at the present time."

He was roundly booed.

Mac Metaphors

"When the Mac first came out, it was viewed by Apple as a Cuisinart," observed General Computer Corp. President **Kevin Curran** of Cambridge, Massachusetts. "When I first saw the machine, I said to myself, 'This is a wonderful metaphor for a personal computer. I think there ought to be about 25 different versions of it.'

"I'm looking for Apple to diversify, for more types of Macintoshes to be offered. Look at the MS-DOS world. You can get portables, high-performance units, color standards, and a graphics standard, which is useful to architects and engineers. I'm looking for the development of the Mac standard and a broadening [of the market] in '86-'87."

> *"What you're going to see over time is micros as windows into all kinds of minis and mainframes."*
>
> —Eddie Currie, President, Lifeboat Associates

A Fast Act

Eddie Currie, President of the New York-based Lifeboat Associates, was the only member of the panel who had no personal investment in the Macintosh market. While his original remarks were particularly virulent toward the Mac and produced a visibly distressing effect on the audience, by the end of the session he had apparently been swayed by their high emotions. His parting words were conciliatory: "My guess is, in the near term, the fastest way to get into contact with computers is to use a Mac."

Did Currie really mean that, or was he just afraid for his life?

Brain Power

During the long Q & A session, one of the members of the audience had an interesting observation to make about the Macintosh vs. the IBM PC in the context of left brain/right brain theory as it applies to computer technology.

Chris DeSantos, a systems analyst and software developer for the Church of Jesus Christ of Latter-Day Saints in Salt Lake City, Utah, said, "I think it's very interesting that the Mac ROMs allow for cursor keys and the IBM PC is struggling to create windows, graphics, and the like. Everyone needs both capacities [of the brain], some to a greater extent on the left, and some to a greater extent on the right.

"Apple may go down the tubes, but what I perceive as our function here is to share ideas about how we can promulgate and preserve the right-brain technology–the graphics, the wonderful things you can do with the computer. Whether or not Apple survives as a company, we need the technology Apple has to offer."

Then DeSantos offered a whole-brain challenge that would affect the future marketing of the Macintosh's innovative technology: "What can we as users do to create some sort of unification and standard in this kind of technology so that the cloning, the development, and the free market competition can take place with this technology as it has with the PC technology?"

Post-Panel Depression

How did the panelists feel afterward? "For the number of people participating, not many of them buy software," snipped **Jim Johnson,** President of Human Edge Software in Palo Alto, California.

Philippe Kahn was more affable. "An irrational fantasy," he mused. "But they're nice guys–they love their machine. The funny thing is to see how Apple has been able to con users that it's good for them that the architecture be closed."

Kahn directed his comment toward a man–identified only as Ray–who spoke lengthily during the Q & A segment about his own evolution as a PC user. Ray had praised the Mac for being a closed-architecture machine because of its protected, all-in-one, secure environment.

"They learned their lesson well and they repeat it well," observed Kahn, "even though Apple will soon be doing a color Mac and an open Mac."

Bumping into **Will Zachmann** on the Expo floor, Kahn groused, "I thought I'd be the only Cassandra in the bunch." Zachmann said he was happy to see that the flakes were still alive and well in California, that it would offer an innovative edge to Macintosh technology worship.

Currie Powder

Relaxing in the *Macworld* lounge before he headed off to the airport, **Eddie Currie** shared some rather spicy insights about the changing role of computers. "Data movement is going to be really interesting to watch in terms of growth," Currie predicted. "Data movement is really just accessing large data bases, which are never going to go on personal computers–even if they do have CD-ROMs. You'd be spending a half-hour for the thing to access. Using technology that slow is not going to work.

"It's not going to take serious people too long to figure out that what they ought to do is go back to using minis and mainframes in more creative ways.

"First, you get random machines, then clumping of machines, then wires running between clumps of machines. Then someone says, 'Here's a 370.' The clumps really allow you to access the 370.

"What you're going to see over time is micros as windows into all kinds of minis and mainframes."

The 512K Close Call

Until recently, Apple seriously considered dropping the 512K Macintosh altogether, upgrading the Apple II to a 16-bit machine, and positioning the Apple II as a small-business computer. The Macintosh would then have been relegated to corporate niches, desktop publishing, and the like. Apparently, when Apple raised this flag of intention, Microsoft and other software companies were outraged. After they threatened never to support Apple for the rest of the twentieth century, Apple backed off.

One of the most evident problems is that Apple is still largely in the hands of people who are Apple II cronies. They had a good Christmas season, and they continue to think that the Apple II is going to live forever–that they can keep upgrading it, that it's a great small-business machine, and so forth.

Having been thwarted in their 512K coup attempt, the Apple oligarchs are probably going to support both machines equally. They are going to give maximum support to both families–without giving up on their 16-bit Apple II plan.

What has held Apple back more than anything has been the infighting and the controversy in the company over the past couple of years. Apple consequently lost nearly 18 months of development time.

In the seven months since Steve Jobs' departure, Apple has managed to introduce the Mac Plus, the LaserWriter II, and, not insignificantly, the $3\frac{1}{2}$-inch disk drive for the Apple II, which will lead to data file compatibility between the Apple II and the Macintosh. Eventually, the two operating systems will evolve into one. And in case you follow these matters, the code name for the "revolutionary" computer that will unite the Macintosh and the Apple II is Aquarius. Expect a 1987 announcement.

Where Was Woz?

Although scheduled to participate in the panel "Future of the Apple II," **Steve Wozniak** canceled at the last moment. "What is the future of the Apple II?" asked Owl International President **Alan Boyd.** "It doesn't have a future, but it does have an extensive past."

Woz had addressed a user group in Silicon Valley the previous evening, apparently with mixed results. Maybe

he got bummed out by the experience. *Macworld* Editorial Manager **Janet McCandless** reported, "He was trying to associate with the user group identity, but the user group people are no longer hackers. When he went into the history of how he got involved in developing the Apple II, it was not only that he was talking about the past, instead of addressing the future or even the present, but his very attempt to connect with the user group that way showed how out of touch he really is."

To add to his woes, employees have been deserting Woz's company, Cloud 9. We called to find out what was going on.

"CL 9, " answered a cheery voice. "No, Steve is not in. He'll be unavailable for a month. We had some changes in the company, and he had to get reorganized before he left. He was so bombarded that he left town so he could get some work done."

Wozniak is now a $20,000 consultant for Apple. That doesn't seem like much money for the great Woz. Maybe he should do some other consulting work as well. Atari perhaps?

Candied Apples

Macworld Expo was preceded by the 1986 AppleWorld Conference, where Apple's new product and marketing strategies were announced to over 2000 dealers, developers, and media people. Red double-decker bus-es piped in dealers from as far away as Brazil and Japan. Black banners bedecked the cavernous concourse, where a screen projected a larger-than-life **John Sculley**, who later pronounced, "January 16, 1986 is the first day of the future of Apple."

Rock music greeted early arrivals at 7:30 a.m. "Rock music the first thing in the morning?" a computer journalist asked in amazement. "Yeah, it's a tribute to **Steve Jobs**," a colleague replied.

Jacques Gauchey, a correspondent for *La Tribune d'Economie* (the Gallic equivalent of the *Wall Street Journal*) quipped, "Everything

> *"AppleWorld was the single most important event since I've been at Apple Computer."*
>
> —John Sculley, Chairman, President, and CEO, Apple Computer

is a tribute to Steve Jobs. It's certainly not Sculley who would have had the idea for this bright environment."

On each side of the video screen above the stage hung red flags with yellow, black, and blue bars, a burst of silhouetted stars, and an Apple logo. It looked suspiciously like a Communist flag. "The apple has replaced the hammer and sickle," observed a political analyst of the computer industry.

In fact, the slide show that led into Sculley's intense address ran through a collage of Apple life showing the members of the Politburo: party chairman Sculley, party architect Wozniak, but notably omitting the original party theorist, Jobs.

"It was like Trotsky had been dropped from the map," commented an observer.

After the Bandwagon

"How many times can Apple say, 'This is history we're making.' I half expected someone to come up and throw a hammer at the screen."–**Steve Levy**, computer journalist

Macworld Contributing Editor **Danny Goodman** noted that he had been invited to visit Apple the week before to preview the Macintosh Plus and other new products. "Now you have an open-closed Mac retrofitting to history," he commented.

"Did you ask them if they had any other closed systems on the drawing board?" I inquired.

Last Temptations

The Apple party at the Galleria featured performances by ex-Temptations Eddie Kendriks and King David Ruffin. The floor was packed with dancing do-gooders and Apple evangelists. Like a *Star Wars* preview, laser bursts from the fourth-floor landing splintered incandescent sparks off the revolving crystal ball. Twenty years from now, on the

Fourth of July, the United States will host a global fireworks display of laser lights, maybe even using a Macintosh interface.

Steve Levy, author of *Hackers*, related how he had recently visited **Steve Jobs**' Next, Inc. "It's funny," he told us, "[the employees said] they were reminded that it is not only great to work for Jobs–it is also hell."

The news had just broken out that Apple had settled its legal beef with Jobs that afternoon. **John Sculley** was at the Galleria bar, and Apple docu-dramatists with mini klieg lights captured the moment.

Deafening loudspeakers blasted Apple's 1986 rock anthem, based on a Patty Labelle song and sung by one of the Pointer Sisters: "We are Apple, and we lead the way. Tomorrow's much brighter, for Apple is leading the way."

San Francisco Chronicle high-tech reporter **John Eckhouse** identified the singer as the "One-Pointer Sister."

Looking Good

Jean-Louis Gassée, the urbane Vice President of Product Development at Apple who was voted one of the ten best-dressed men in France by the French *Vogue* magazine, sauntered down the aisles at the Macworld Expo. "It's very positive," he said, referring to the show. "I see a lot of people walking around with money in their pockets. They seem to like the improvement we made on the Mac Plus." Responding to criticism that the improvements should have been made a year earlier, he said, with a shrug and not a single crease showing anywhere, "I wasn't there."

Buyer, Be Where?

Business was booming at the booths. At the TransAmerican Exchange stall the action was so fast and furious it was like feeding time at a piranha way station. "I'm selling a lot of the hottest new games, accessories, double-sided drives, and numeric turbo-touchers," said **Brian Mallon**, President of the Austin, Texas, discount dealership.

"We're probably going to clear $35,000 to $40,000 in three days," he claimed. And the cost of the booth is only $1500. Mindscape's *Deja Vu* is a best-seller, along with *Balance of Power*."

"It comes to $102," said a salesperson to a shopper. "Ninety plus tax," haggled the shopper.

Overhearing the transaction, Mallon said, "Okay, go for it." Meanwhile a passing customer purchased *Microsoft Excel*, a $349 retail value, for only $249.

Another potential buyer asked, "How much is *Crunch* going for?"

"It retails for $295," Mallon replied.

"I'll give you $20 for it."

"That's too inexpensive," Mallon maintained.

"Yeah, but $295 is not impulse yet."

One TransAmerican Exchange salesperson, ready to close a sale on a Visa imprinter, quipped: "I never met anyone who owns a Mac who isn't an impulse buyer."

Lotus Letdown

Down the road from the TransAmerican Exchange was retirement city, a sleepy Lotus booth with more Lotus people than browsers. A backwater of ennui. Lotus claimed that it was in a poor traffic location, behind the Layered, Inc. booth. But right next to it Borland International had shouting room only. Its Las Vegas lounge act was in full swing as a sleazy emcee awarded easily won prizes to contestants of the Borland game show. "All right, you've won a coffee cup, you wanna try for a T-shirt?"

I believe *Jazz* will do great on the Mac Plus. My only complaint with the program is that it takes up too much memory on a 512K machine. But with 1 megabyte, it's wonderful. It handles large documents effortlessly, and easily mixes graphics and text.

Jazz will gain strength as *Symphony* did on the PC. Remember that *Symphony* was not initially received well, but over time it gained popularity.

Fistful of Dollars

Looking as if Sergio Leone had cast him in a Cary Grant film was dapper **Ted Leonsis** with a dark beard and a gray, silver-threaded pinstripe suit. Leonsis did alright with Thompson International, which bought Redgate Publishing from him for a cool $4 million. When the market dropped, he bought his baby back for, some say, less than the cost of the bathwater.

Bumping into Leonsis in the aisle, I asked him how business was at his *Mac Buyer's Guide* booth. He said it was terrific, that they had been giving thousands of copies away. Then he decided to sell them for $2 each. How did that go? He grinned and whipped out one of the fattest rolls of $50s and $20s I have ever seen–he needed only another $80 or so to cover his show expenses and airfare home.

Earn While You Learn

With Apple strongly targeting the higher education market with its Macintosh line, it was interesting to see what the universities were up to in their ivory Mac towers. The far corner of Brooks Hall was devoted to the software groves of academia (a variety of university computational centers and departments had banded together for a joint exhibit). Incredible!

No doubt these quiet academics working on their esoteric projects will devise some revolutionary software that will be successfully integrated into the mainstream market. One such package is Learning Skills' *Note Taker*, a *ThinkTank*-like program that compresses information into a simple outline grid of ideas, and has built-in review-test formats.

Developer **Larry Doyle**, who wrote the program for the University of Nevada School of Medicine, pointed out that the average medical student takes six to eight hours of notes a day. Although "note-taking co-ops" were formerly the most effective way to document lectures, with *Note Taker* an entire lecture can easily be reduced to its basic elements. Besides, it is easier to pass around a disk than ratty photocopies of notes.

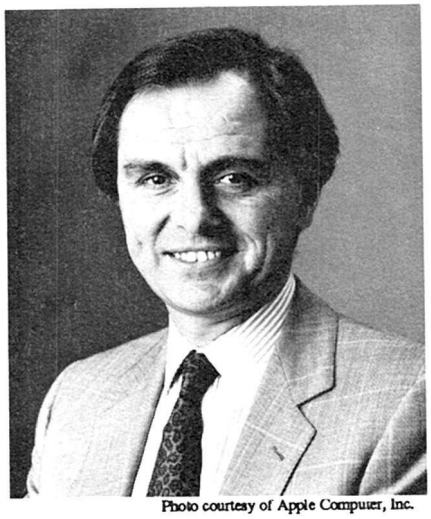

Photo courtesy of Apple Computer, Inc.

Apple's new visionary Jean-Louis Gassée: a charming powerhouse

Doyle mentioned that the school's dean once required that each student own a microscope. The latest requirement is, forget the 'scopes, you have to own a Macintosh.

An excellent source of information on software development within the universities is Apple's quarterly catalog *Wheels for the Mind*. The Winter 1986 edition is available now.

Dinner at Modesto's

For *Macworld*, the Expo's finale consisted of a dinner for various industry guests and luminaries at Modesto Lanzone's elegant Italian restaurant located in San Francisco's Opera Plaza.

Even the waiters were computer literate. As one waiter said, "I'm getting my motherboard upgraded because it's generating wavy bands." The bartender replied, "I get that problem all the time. I can't generate anything." Yet another waiter put down his tray and said to the first, "Would you be a little more specific."

At dinner, Ergotron President **Harry Sweer** commented on the show's success: "I placed more product than I sold in the previous four months."

Peter Hart, President of the Toronto-based Model Office Company, which produces *Document Modeler*, revealed that he had hired a clinical

psychologist to do on-the-spot market research to help target their advertising. Futurist **Alvin Toffler** had stopped by the booth, fell in love with the program, and said, "This is a form-filling product, except you guys make up the form as you go along!"

Software entrepreneur **Sat Tara Khalsa**, in his famed white turban, said that the Macworld Expo reminded him of "the West Coast Computer Faire six years ago."

Apple's new visionary **Jean-Louis Gassée** sat at a table with PC World Communications CEO **Bart Rhoades**. Gassée said that he had delivered a Macintosh Plus to Steve Jobs' mansion in Woodside, California. "There's no reason I can't still love the S.O.B.," he said.

Rhoades allowed later on that Gassée was a charming powerhouse. "One thing that struck me was his perception of the future," Rhoades reported. "He has a clear vision of an evolutionary family of machines, of integrated software products from a development point of view. Gassée is a major technological force."

Some Microsoft pickings sat at another table. Microsoft, which is going public in the near future, is in the process of designing its first corporate brochure. Apparently 1986 was always destined to be the year of going public. Conjecture is that it's because it is Microsoft Chairman **Bill Gates**' thirtieth birthday. While writing the brochure, the company discovered that half the corporate heads do not have college degrees. Evidently, President **John Shirley** left school to sell computers at Radio Shack. And Gates is a notorious Harvard dropout.

> *"Desktop publishing will do for the printed page in the 1980s what xerography did for the printed page in the 1960s."*
>
> —John Sculley, Chairman, President, and CEO, Apple Computer

An amusing tidbit for dessert: Microsoft had a dynamite advertising campaign aimed at knocking Lotus, but it was vetoed as being too aggressive. The headline: "1-2-3, You're Out."

Fine Print

The hottest craze in the Macintosh community these days is desktop publishing, using personal computers and laser printers to generate near-typeset-quality text and graphics. The Expo held two conferences on the subject. Overflowing audiences reflected the huge, immediate interest in this burgeoning new field. So far, the Macintosh has a strong lead over the PC in desktop publishing, and Apple is determined to maintain its edge.

John Skull, Vice President of Marketing for the Apple Desktop Publishing Group, is excited about the prospects and possibilities of this field. "Desktop publishing is the *VisiCalc* of the '80s," Skull proclaimed. "Apple is listening carefully to the public right now," he continued. "We want to make sure that people get what they want–and our product announcements prove that we're meeting demands. If you want more fonts and color–that's what we'll give you." You can expect to see considerably more application-specific advertising from the folks at Apple.

PC World Communications is equally enthusiastic about desktop publishing. On January 17 we signed a letter of intent to acquire *Desktop Publishing*, a magazine devoted to instructing and informing people about developments in this volatile market. The new version will be inserted in the July issues of *PC World* and *Macworld*, and will subsequently be published bimonthly.

Meanwhile, for over six months we have been reaping the benefits of desktop publishing at *Subroutines*. We produce the newsletter using the Macintosh, Aldus' *PageMaker*, and the Apple LaserWriter.

Subroutines is published by PC World Communications, Inc.
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An annual subscription to *Subroutines* is $195 (outside the U.S. add $25 for postage). Direct all communications to *Subroutines*, 555 De Haro St., San Francisco, CA 94107, 415/861-3861.

SUBROUTINES

Personal Computer Forum Special
February 19, 1986

David Bunnell's Newsletter From Inside the Personal Computer Industry

Thumbs Up!

IBM Sees Steady Growth Ahead

The personalities of the personal computer industry–great, near great, and would-be great–convened among the steaming Jacuzzis and swimming pools of The Pointe Tapatio, the Phoenix, Arizona, resort where *Release 1.0* Editor **Esther Dyson** held the 9th Annual Personal Computer Forum from February 16–19.

The dress code for the 410 registered conference attendees was "informal," although as industry standards go, that meant sports clothes for some, such as **Mitch Kapor**, whom Esther endearingly referred to as "the guy in the Hawaiian shirt," and suits–with and without ties–for others.

"It's clear, Mr. Sculley, your gray suit appears to be 90 percent compatible with [Robert] Carberry (Vice President of the Entry Systems Division at IBM)," observed **Dave Watson**, a self-described "ordinary programmer," as he addressed Apple's CEO after the keyntote panel on the topic of "Standards for/vs. Innovation."

At the opening night's cocktail reception, venture capitalist **Ben Rosen** swept into the ballroom with a blinding polkadot tie that he was obviously beta-testing. Where did he get it? "First you buy a white tie; then you put stickers on it," he explained.

Bread and Rosen

Ben Rosen chatted with Software Publishing President **Fred Gibbons**, who looks absolutely great, by the way, and who is inspiring to us all with his dramatic recovery after a serious skiing accident. "You working?" Rosen asked him. "Hell, yes."

> *"We have come to a balance point."*
>
> —Robert Carberry, VP, Entry Systems Divsion, IBM

Monday, Monday

Breakfast at 7 a.m., first session at 7:45. It's amazing that **Esther Dyson** can get people up at such an early hour. They did complain about having to wake up so early–but they were all there.

Phoenix Rising

The industry doldrums are over. Everything is going to come up roses. That was the message that IBM gave to the movers, shakers, and survivors of the computer industry assembled in Phoenix.

Robert Carberry was the first person to speak at the keynote panel and sighted projections that the computer industry can look forward to a period of positive, stable growth.

Scolding From Sculley

John Sculley warned that industry standards that don't allow for future innovation will end up stifling the industry's growth instead of regulating it.

"Innovation must be tied to customer solutions," Sculley insisted. "You can't just innovate and hype technology. You've got to identify the markets."

Sculley cautioned that one of the risks of standardization is the threat of Korea, Taiwan, and Japan moving into the market with low-cost, high-quality products that offer consumers a wide variety of choices.

The Grand Canion

As could be expected, there was a huge gulf between Sculley's market perceptions and those of **Rod Canion**, President and CEO of Compaq Computer.

"There are no limits to innovation within the industry standard," Canion challenged Sculley. He argued that everything that can be done in a Macintosh environment can and will be done in the MS-DOS world.

Open Windows

It's rather amazing how well *Microsoft Windows* is being received as a standard interface by almost everyone at the Forum. **Danielle Barr**, Vice President of Corporate Systems for the Bank of New England, raved that *Windows* allows for a consistent user interface.

"Would you agree to go on **Bill Gates**' road show ?" **Esther Dyson** asked her. To which Bill Gates, facing Microsoft's going public, quipped: "She's too positive, the lawyers wouldn't allow it."

Meanwhile, Lotus Chairman **Mitch Kapor** (aka "the guy in the Hawaiian shirt") said that Lotus would be announcing application programs for *Windows* in "1987 and beyond."

Javelin Chairman and CEO **Robert Firmin** asserted, "*Windows* brings integration to computers the way it should have been in the first place." The only contrary view came from **Fred Gibbons**, who explained his philosophical position in this manner: "If it makes sense, use it. If it doesn't, don't." He believes that universal acceptance of *Windows* would be premature at this time.

According to Fred, there is still a great deal to be done with existing tools.

Floppy Tacos

At one cocktail party, Apple Chairman, President, and CEO **John Sculley** ambled over to Software Garden President **Dan Bricklin**, who was tossing tacos into his mouth. A nerdy-looking programmer asked Sculley, point blank, "Why don't you have color on the Mac?"

Bricklin quickly came to Sculley's defense. "Is it more important than slots?"

"No," admitted the programmer.

"Is it more important than screen size?"

No, again.

"Is it more important than memory?"

No.

"There, you see," Bricklin shrugged, his case closed.

Top 10 Missing From the Forum

1. **Steve Jobs**, Chairman, Next, Inc.
2. **John Roach**, Chairman, Tandy Corp.
3. **Jack Tramiel**, Chairman, Atari, Inc.
4. **Anyone from Commodore**
5. **Adam Osborne**, President, Paperback Software
6. **Jean-Louis Gassée**, Vice President, Product Development, Apple Computer
7. **George Morrow**, President, Morrow Designs
8. **John Brockman**, agent
9. **Wes Thomas**, publicist
10. **Bob Lydon**, Publisher, *Personal Computing*

Peep From Philippe

Borland President **Philippe Kahn** shared an amusing marketing idea with us at the hotel's Pointe in Tyme restaurant one evening: "I often envision how it would be great to buy all the integrated packages on the market and bring them all out on one CD-ROM disk called *Integrated Packages of the '80s.*" Philippe sounded like a late-night television announcer selling an oldies-but-goodies album when he practiced his would-be pitch: "Buy 'em all on one disk!" Then he paused to add, "Maybe Mitch [Kapor] would include *Symphony.*"

CD-ROM Rumblings

Jim Porter, moderator of the CD-ROM lunch panel, asked: "In 1990, what percentage of office PCs and home PCs will have access to CD-ROM, whether direct or not?"

Bill Gates, the Rommel of CD-ROM technology, predicted that 10 percent of all offices will have CD-ROM access by the beginning of the next decade. Ninety percent would be found in the home environment, he claimed. "But they won't be called PCs," he observed, citing the emergence of a new hybrid home machine. "A lot [of them] won't have keyboards or floppy disks."

In the meantime, one of the panelists admitted that he could benefit from having a CD-ROM system right now, because he was spending too many late nights writing school reports for his six-year-old daughter. He said he would wait another year, though, for the prices to drop. To which **Philippe Kahn** retorted: "If

you wait a year, your daughter might run away from home."

Gary Kildall, founder of Activenture Corp., voiced his fears. "An entire [CD-ROM] disk could go to Taiwan," where it would be duplicated. That's why Kildall felt that it might be better to keep CD-ROM technology nonstandardized, as opposed to creating a general standard that would make life easy for pirates.

Multimedia Software

Bill Gates introduced the concept of "multimedia software." Utilizing CD-ROM technology, it mixes voice, music, and video stills. There's a problem with a storage capacity of only 10 megabytes, said Gates. But when you've got 540 megabytes, you're in business. That comes to about 60 minutes of the multimedia presentation.

Jim Porter observed: "I presume you know that CD-ROM is basically a free gift from the entertainment industry to the computer industry."

Theory of Connectivity

"I come here for the gossip–that's what it's all about," said Funk Software President **Paul Funk** while percolating in the Jacuzzi.

In another hot tub, **Mitch Kapor** jokingly explained his philosophy of using rumors as development tools. "We read all the rumors in *PC Week* and *InfoWorld*, and the ones we read most often about we then develop into programs."

Fred Davis shared this tip with us: Microsoft is planning to introduce a TV with a built-in CD-ROM drive.

Bill Gates was seen having dinner with **Robert Berland**, Director of Strategic Planning for IBM. Naturally, this has given rise to speculation that IBM and Microsoft have something cooking on *Windows*. "Our goal is to work together, but I'm not free to pre-announce anything," Berland said during a panel question-and-answer session. Gates quickly added: "I agree to that."

Sounds like they've already gotten together.

AI Sauce

The AI panel quickly turned into a techie debate with some amusing relish. For example, as **Carl Wolf**, President of Gold Hill Computers, observed: "LISP was developed as a language to sell procesors."

"It is sort of like talking about hamburgers, only we're going to make them out of Lawry's seasoning," noted **Dan Bricklin**.

Mitch Kapor predicted that AI technology such as DWIM ("Do What I Mean" as opposed to DWIS, or "Do What I Say" software) would happen "sooner rather than later"–by 1987 or 1989, instead of 1990–1999, as some AI analysts would have it.

From the audience, **Robert Berland** made the observation that "marketing and education are the biggest problem with AI–not how to make use of it."

Esther Dyson quipped, "The real market is AI education." Everyone laughed.

Poolside Poll

*This time next year. . . .**

Number one software company: Lotus
Number one word processor: *WordPerfect*
Number of CD-ROM drives installed: 20,000
Street price of floppy -based AT: $1295
First 386-based-machine manufacturer: Tandon
Major merger: Cullinet/Ashton-Tate

* Sample of 20 random luminaries

Crossing the Software Channel

The software distribution mix is changing radically–with the market undergoing a major shakeout, the forum's software panelists agreed.

David Wagman, Co-Chairman of Softsel Computer Products, said, "The pieces are getting littler and littler."

Ed Esber, President and CEO of Ashton-Tate, was horrified at the idea of there being only one major software supplier left in the market. "If we eliminate the channel conflict, we're sowing the seeds for a lazy channel," he warned.

Quotes and Pokes

"We're talking about the maturity of an industry that isn't out of diapers yet."—**Robert Berland**, Director of Strategic Planning, IBM

"Next year we'll start to see the first educational programs that actually teach people something."—**Doug Carlston**, President, Brøderbund Software

"1986 is the last year that software can be developed to run on both the low-end and high-end machines."—**Robert Carr**, Forefront/Ashton-Tate

"1986 is the 5th Annual Year of the Network."—**Mitch Kapor**, jokingly.

"No, we're not going to put Mac technology into the public domain, but we may do some OEMing in the future involving Mac technology products."—**John Sculley**

"Yes, we want to make this all one world. We want go back to the universal telephone company basically."—**Philippe Kahn**, President, Borland International

Esther Dyson recalled something that **Steve Jobs** had said at an earlier Forum: "There should be a mother in every box to provide standard support . That, in a sense, is what we're looking for."

Other Esther quotes: "Integration is connectivity in a single machine." "Are dealers interested in new software, or do they just want a few pennies off *1-2-3*?"

A noted software pioneer was overheard griping: "Year after year, the panelists extol innovation. Okay, I'm trying as hard as I can to innovate, but they're still saying the same old thing."

"This is just a social event. People aren't going to give away anything to their competitors."—**Bob Frankston**, Chief Scientist, Information Services Division, Lotus Corp.

"Just as *MacPaint* spawned a whole generation of lousy artists, *PageMaker* is going to spawn a whole generation of lousy designers,"–**Fred Davis**, Editor of *A+* magazine.

Buddy Diamond, President of XOR, talking with Bart Rhoades, CEO, PC World Communications, Inc. and a few other people, told a woman, "If you want to talk to Bart and I, you gotta talk faster."

Hardware–How Low Can It Get?

During the hardware panel, **Esther Dyson** jokingly said to Bobbie Orbach of 47th St. Computer, in reference to **Tom O'Leary, Jr.**, Director, MIS Technology for North American Phillips: "He could be a customer of yours."

Orbach replied, "He is."

The big question asked at the hardware panel concerned the rise of the low-cost computer.

Esther Dyson asked the panelists: "Do you see a $1000 IBM PC by the end of the year?"

Rod Canion was quick to respond: "There are all kinds of problems associated with $1000 PCs, which would create distribution problems and ruin profit margins." Nevertheless, Canion conceded that there was a slow but steady path downward for all PCs.

Competing Compatibles

Rod Canion also claimed that the ability to be truly compatible was not so easy to achieve. A lot of people would discover with their low-end computers that their machines were not entirely compatible with most software, he cautioned. The cheaper clones might not have adequate power supplies or the right slots, or have other shortcomings that would not become apparent until later.

Jim Porter countered that by saying that U.S. manufacturers could benefit from the competition. "The level of competition [say, from Japan or Korea] will be directly proportionate to the stability of the industry standard," he noted.

Therefore, unless IBM and Compaq are both prepared to produce low-cost machines, they're going to be in trouble, Porter predicted.

Tom O'Leary, Jr. revealed that North American Phillips buys its clones from AT&T and Telex. "We don't like the terms and conditions or the way IBM sells machines," he explained. "IBM can't compete with their dealers when it comes to deliveries."

So NAP still buys IBM PCs, but only from dealers, not from Big Blue itself, O'Leary opined.

Subroutines is published by PC World Communications, Inc.
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An annual subscription to *Subroutines* is $195 (outside the U.S. add $25 for pastage). Direct all communications to Subroutines, 555 De Haro St., San Francisco,k CA 94107, 415/861-3861.

SUBROUTINES

Volume 5, Number 3
March 1986

David Bunnell's Newsletter From
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PC Gurus Optimistic at Phoenix Forum

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Welcome back Fred! Fred Gibbons is enjoying the sun with Software Publishing co-founder, Janelle Bedke.

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Gibbons and Rosen

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The optimism of his speech and the fact that IBM participated in full force with 11 people at the Forum was very encouraging to most attendees.

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The Grand Canion

As could be expected, there was a huge gulf between Sculley's market perceptions and those of **Rod Canion**, President and CEO of Compaq Computer.

"There are no limits to innovation within the industry standard," Canion challenged Sculley. He argued that everything that can be done in a Macintosh environment can and will be done in the MS-DOS world.

Open Windows

It's rather amazing how well *Microsoft Windows* was received as a standard interface by almost everyone at the Forum. **Danielle Barr**, Vice President of Corporate Systems for the Bank of New England, raved that *Windows* allows for a consistent user interface.

"Would you agree to go on **Bill Gates**' road show?" **Esther Dyson** asked her. To which Bill Gates, facing Microsoft's going public, quipped: "She's too positive, the lawyers wouldn't allow it."

> *"CD-ROM is basically a free gift from the entertainment industry to the computer industry."*
>
> —Jim Porter, President Disk/Trend

Meanwhile, Lotus Development Chairman **Mitch Kapor** (aka "the guy in the Hawaiian shirt") said that Lotus would be announcing application programs for *Windows* in "1987 and beyond."

Javelin Chairman and CEO **Robert Firmin** asserted, "*Windows* brings integration to computers the way it should have been in the first place."

The only contrary view came from **Fred Gibbons**, who explained his philosophical position in this manner: "If it makes sense, use it. If it doesn't, don't." He believes that universal acceptance of *Windows* would be premature at this time. According to Fred, there is still a great deal to be done with existing tools.

With or Without?

Microsoft Chairman **Bill Gates** was huddling with **Bobbie Orbach**, director of computer sales for 47th St. Computer. "Do you have a business card?" Orbach asked him. Gates dipped into his worn wallet, searching. "Wait a minute," he said, finding a ratty business card and handing it to Orbach. "You really should do *Access Windows*," Orbach advised. "It runs so smooth, it's like molasses."

Gates looked quizzical and asked, "Is that where you run *Access* as part of *Windows?* It really should run full stream, you know," Gates said. Orbach looked nonplussed for a moment but then responded, "No, it's the other way around. It *[Access]* was running behind *Windows*."

CD-ROM Rumblings

Disk/Trend President **Jim Porter**, moderator of the CD-ROM lunch panel, asked: "In 1990, what percentage of office PCs and home PCs will have access to CD-ROM, whether direct or not?"

Microsoft Chairman **Bill Gates**,

the Rommel of CD-ROM technology, predicted that 10 percent of all offices will have CD-ROM access by the beginning of the next decade. Ninety percent would be found in the home environment, he claimed. "But they won't be called PCs," he observed, citing the emergence of a new hybrid home machine. "A lot [of them] won't have keyboards or floppy disks."

In the meantime, one of the panelists admitted that he could benefit from having a CD-ROM system right now, because he was spending too many late nights writing school reports for his six-year-old daughter. He said he would wait another year, though, for the prices to drop. To which **Philippe Kahn** retorted: "If you wait a year, your daughter might run away from home."

Gary Kildall, founder of Activenture Corp., voiced his fears. "An entire [CD-ROM] disk could go to Taiwan," where it would be duplicated. That's why Kildall felt that it might be better to keep CD-ROM technology nonstandardized, as opposed to creating a general standard that would make life easy for pirates.

Peep From Philippe

Borland President **Philippe Kahn** shared an amusing marketing idea with us at the hotel's Pointe in Tyme restaurant one evening: "I often envision how it would be great to buy all the integrated packages on the market and bring them all out on one CD-ROM disk called *Integrated Packages of the '80s*." Philippe sounded like a late-night television announcer selling an oldies-but-goodies album when he practiced his would-be pitch: "Buy 'em all on one disk!" Then he paused to add, "Maybe Mitch [Kapor] would include *Symphony*."

Top 10 Missing From the Forum

1. **Steve Jobs**, President, Next, Inc.
2. **John Roach**, Chairman, Tandy Corp.
3. **Jack Tramiel**, Chairman, Atari, Inc.
4. **Anyone from Commodore**
5. **Adam Osborne**, President, Paperback Software
6. **Jean-Louis Gassée**, Vice President, Product Development, Apple Computer
7. **George Morrow**, President, Morrow Designs
8. **John Brockman**, agent
9. **Wes Thomas**, publicist
10. **Bob Lydon**, Publisher, *Personal Computing*

Multimedia Software

Bill Gates introduced the concept of "multimedia software." Utilizing CD-ROM technology, it mixes voice, music, and video stills. There's a problem with a storage capacity of only 10 megabytes, said Gates. But when you've got 540 megabytes, you're in business. That comes to about 60 minutes of the multimedia presentation.

Jim Porter observed: "I presume you know that CD-ROM is basically a free gift from the entertainment industry to the computer industry."

Floppy Tacos

At one cocktail party, **John Sculley** ambled over to Software Garden President **Dan Bricklin**, who was booting tacos into his mouth. A nerdy-looking programmer asked Sculley, point blank, "Why don't you have color on the Mac?"

Bricklin quickly came to Sculley's defense. "Is it more important than slots?"

"No," admitted the programmer.

"Is it more important than screen size?"

No, again.

"Is it more important than memory?"

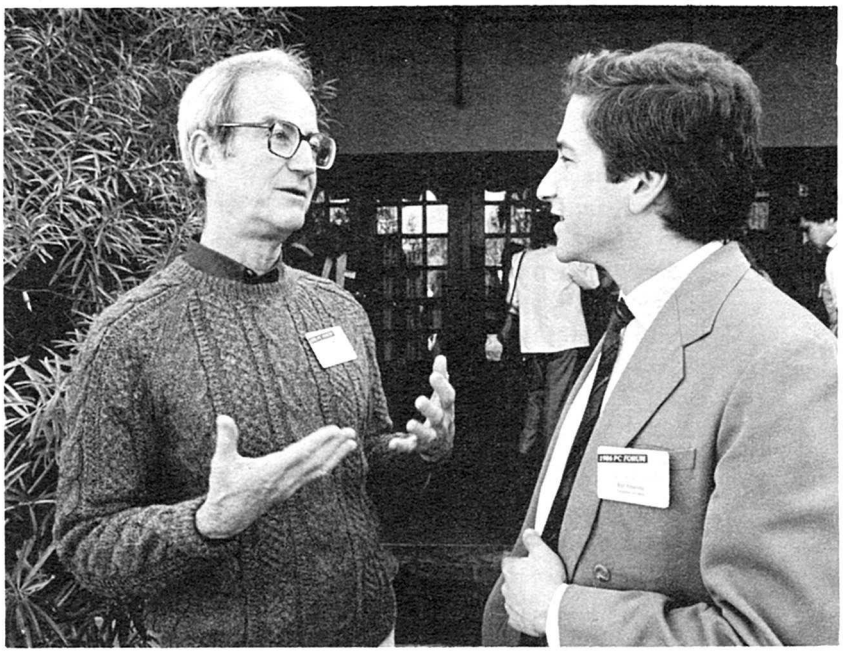
No.

"There, you see," Bricklin shrugged, his case closed.

Theory of Connectivity

"I come here for the gossip–that's what it's all about," said Funk Software President **Paul Funk** while percolating in the Jacuzzi.

In another hot tub, **Mitch Kapor** jokingly explained his philosophy of using rumors as development tools. "We read all the rumors in *PC Week* and *InfoWorld*, and the ones we read



Casual conversation or major deal making? Venture capitalist Ben Rosen (left) chats with Corporate Software Chairman Mort Rosenthal.

most often about we then develop into programs."

A+ Editor **Fred Davis** shared this tip with us: Microsoft is planning to introduce a TV with a built-in CD-ROM drive.

Bill Gates was seen having dinner with **Robert Berland,** Director of Strategic Planning for IBM. Naturally, this has given rise to speculation that IBM and Microsoft have something cooking on *Windows.* "Our goal is to work together, but I'm not free to pre-announce anything," Berland said during a panel question-and-answer session. Gates quickly added: "I agree to that."

Sounds like they've already gotten together.

AI Sauce

The AI panel quickly turned into a techie debate with some amusing relish. For example, as **Carl Wolf,** President of Gold Hill Computers, observed: "LISP was developed as a language to sell processors."

"It is sort of like talking about hamburgers, only we're going to make them out of Lawry's seasoning," noted **Dan Bricklin.**

Mitch Kapor predicted that AI technology such as DWIM ("Do What I Mean" as opposed to DWIS, or "Do What I Say" software) would happen "sooner rather than later"–by 1987 or 1989, instead of 1990-1993, as some AI analysts would have it.

From the audience, **Robert Berland** made the observation that "marketing and education are the biggest problems with AI–not how to make use of it."

Esther Dyson quipped, "The real market is AI education." Everyone laughed.

Crossing the Software Channel

The software distribution mix is changing radically–with the market undergoing a major shakeout, the forum's software panelists agreed. **David Wagman,** Co-Chairman of Softsel Computer Products, said, "The pieces are getting littler and littler."

Ed Esber, President and CEO of Ashton-Tate, was horrified at the idea of there being only one major software supplier left in the market. "If we eliminate the channel conflict, we're sowing the seeds for a lazy channel," he warned.

Quotes and Pokes

"We're talking about the maturity of an industry that isn't out of diapers yet."–**Robert Berland,** Director of Strategic Planning, IBM

"Next year we'll start to see the first education programs that actually teach people something."–**Doug Carlston,** President Brøderbund Software

"1986 is the last year that software can be developed to run on both the low-end and high-end machines." –**Robert Carr,** Forefront/ Ashton-Tate

"1986 is the 5th Annual Year of the Network."–**Mitch Kapor**, jokingly

"No, we're not going to put Mac technology into the public domain, but we may do some OEMing in the future involving Mac technology products."–**John Sculley**

"Yes, we want to make this all one world. We want go back to the universal telephone company basically."–**Philippe Kahn**, President, Borland International

Esther Dyson recalled something that **Steve Jobs** had said at an earlier Forum: "There should be a mother in every box to provide standard support. That, in a sense, is what we're looking for."

Another Esther quote: "Are dealers interested in new software, or do they just want a few pennies off *1-2-3*?"

A noted software pioneer was overheard griping: "Year after year, the panelists extol innovation. Okay, I'm trying as hard as I can to innovate, but they're still saying the same old thing."

"This is just a social event. People aren't going to give away anything to their competitors."–**Bob Frankston**, Chief Scientist, Information Services Division, Lotus Development

"Just as *MacPaint* spawned a whole generation of lousy artists, *PageMaker* is going to spawn a whole generation of lousy designers,"–**Fred Davis**

Buddy Diamond, President of XOR, talking with **Bart Rhoades**, CEO of PC World Communications, Inc. and a few other people, told a woman, "If you want to talk to Bart and I, you will have to talk faster."

Hardware–How Low Can It Get?

During the hardware panel, **Esther Dyson** jokingly said to **Bobbie Orbach** of 47th St. Computer, in reference to **Tom O'Leary, Jr.**, Director of MIS Technology for North American Philips: "He could be a customer of yours."

> *"Integration is connectivity in a single machine."*
>
> —Esther Dyson, Editor, Release 1.0

Orbach replied, "He is."

The big question asked at the hardware panel concerned the rise of the low-cost computer.

Esther Dyson asked the panelists: "Do you see a $1000 IBM PC by the end of the year?"

Rod Canion was quick to respond: "There are all kinds of problems associated with $1000 PCs, which would create distribution problems and ruin profit margins." Nevertheless, Canion conceded that there was a slow but steady path downward for all PCs.

Competing Compatibles

Rod Canion also claimed that the ability to be truly compatible was not so easy to achieve. A lot of people would discover with their low-end computers that their machines were not entirely compatible with most software, he cautioned. The cheaper clones might not have adequate power supplies or the right slots, or have other shortcomings that would not become apparent until later.

Jim Porter countered that by saying that U.S. manufacturers could benefit from the competition. "The level of competition [say, from Japan or Korea] will be directly proportionate to the stability of the industry standard," he noted.

Therefore, unless IBM and Compaq are both prepared to produce low-cost machines, they're going to be in trouble, Porter predicted.

Tom O'Leary, Jr. revealed that North American Philips buys its clones from AT&T and Telex. "We

don't like the terms and conditions or the way IBM sells machines," he explained. "IBM can't compete with their dealers when it comes to deliveries."

So NAP still buys IBM PCs, but only from dealers, not from Big Blue itself, O'Leary opined.

Why They Got the Cray

Sculley was at ease. "One day we will have it all," he said. "Color, slots, memory . . . ."

Bricklin was effusive. "You did a great job last year," he noted.

"We're very impressed ourselves," Sculley replied. "In '85 we accomplished everything we set out to do. In '86 we're going to accomplish everything we set out to do, and in '87, ah," he sighed, "it's going to be a bonanza."

"What about the '90s?" Bricklin asked. "We're already working on that," Sculley told him. "That's why we got the Cray." Then he mused, "At Apple we've always had good engineers but not good scientists. We asked ourselves, 'Why is it that it takes so long to bring out a machine after it's been designed?'

"At least one-third of the time is spent waiting for software designers to catch up with the hardware. Now, with the Cray, we're going to simulate a machine and get the software designers to work with it. We've started already. We'll start seeing the results in the late '80s. The Cray is a simulation tool. It is going to let software designers have access to development tools."

"That's what Bill Gates did," Bricklin noted. "He simulated Microsoft BASIC on one of those big machines."

Poolside Poll

*This time next year. . . .**

Number one software company	Lotus Development Corp.
Number one word processor	*WordPerfect*
Number of CD-ROM drives installed	20,000
Street price of floppy-based AT	$1295
First 386-based-machine manufacturer	Tandon
Major merger	Cullinet/Ashton-Tate

**Sample of 20 random luminaries*

Letter to Subroutines

Doesn't Ed Esber of Ashton-Tate deserve the Hypocrite of the Year award?

Quoted from your January 1986 issue, "The whole industry deserves an F for doing a superior job of getting in the way of legitimate users and an inadequate job of getting in the way of pirates."

I don't understand. . . .

—Linda Brandt
Santa Monica, California

Subroutines is published by PC World Communications, Inc.
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An annual subscription to *Subroutines* is $195 (outside the U.S. add $25 for postage). Direct all communications to *Subroutines*, 555 De Haro St., San Francisco, CA 94107, 415/861-3861.

SUBROUTINES

Volume 5, Number 4
April 1986

David Bunnell's Newsletter From Inside the Personal Computer Industry

CD Woodstock

Seattle Conference Sets the Trend in CD ROM (or Is It CD-I?)

They came from around the globe–publishers, information providers, knowledge processors, and hardware hippies–to meet for four days in March at the Seattle Sheraton for Microsoft's First International Conference on CD ROM (compact disk read-only memory). It was an amazing event that will go down in history.

At Woodstock we wore beads, slept on the ground, shared blankets, ate whole-grain foods, and went skinny-dipping in a muddy pond in the middle of a pasture. In Seattle, basically the same generation stayed in first-class accommodations, enjoyed gourmet meals, wore designer threads, and bathed in Jacuzzis on the 35th floor of the Sheraton.

The rules may have changed, but we are still changing the world.

CD Schism

What began as an innocent celebration of CD ROM technology was soon transformed into something else. CD ROM may have become obsolete in its cradle when Sony and North American Philips announced their new CD-I (Compact Disk Interactive) system, which they will introduce to consumers in 1987.

This mood-altering announcement was like suddenly switching channels from the serene sounds of Windham Hill to the cacophonous buzz of Jimmy Hendrix. There were even some bad vibes felt among the 1172 conference attendees as they struggled to cope with the implications of these two apparently different CD standards.

> *"Where we are going, we don't know, but we are going there."*
>
> Philippe Kahn, President, Borland International

"It's not helpful to put two trains on the track," one member of the audience griped after a panel session.

"The most interesting announcement at the show [CD-I] mandates an operating system [based on Motorola's 68000 chip] in direct opposition to the host of the show [Microsoft's MS-DOS, which is based on Intel's 8088 chip]," noted *BYTE* columnist **Jerry Pournelle**.

Om Mani Padme ROM

Even the CD ROM gurus were hard pressed to come up with mantras to pacify the disgruntled crowd.

"Inside every CD-I player beats the heart of a CD ROM," intoned **Stan Cornyn**, President of The Record Group, a CD production company based in Burbank, California.

"CD-I is a form of CD ROM," said Microsoft Chairman **Bill Gates** in an attempt to convince the audience that the two standards are not miles apart. But Philips, Sony, and Microsoft failed to provide details about how a CD ROM/CD-I interface could be achieved. In fact, the Sony/Philips CD-I announcement seemed to take Microsoft by surprise. The purpose of the meeting, after all, was to discuss setting industry standards for CD ROM–not to confront the specter of CD-I.

Suddenly everyone was reliving the mythic CP/M-MS-DOS struggle.

The fact that KnowledgeSet Corp. (formerly Activenture) President and Digital Research founder **Gary Kildall** was the keynote speaker seemed to some industry watchers as an almost prophetic omen about CD ROM as a standard.

Will Kildall miss out again?

Take Me to Your Amiga

All this talk about CD ROM and CD-I compatibility reminds me of the long promised and long overdue IBM card for the Amiga. It has been over a year now, and still no card. Where is it already?

For that matter, as long as we are addressing cosmic issues, will CD-I become the PCjr of the CD ROM field? Will it be kicked out of the cradle before it learns to walk?

Notions and Potions

Part of the problem with CD ROM is that we are creating a momentum for the technology before a real technological foundation has been laid.

What is missing, in my opinion, is the feature of read-only memory on a "write-once disk." You can add your own material–by way of annotations or whatever–by addressing the write-once sections of the compact disk.

One of the answers, of course, is to store data on other memory devices such as chips. Thus, you could go back to your CD ROM viewer without even noticing that you are not saving on a CD ROM disk.

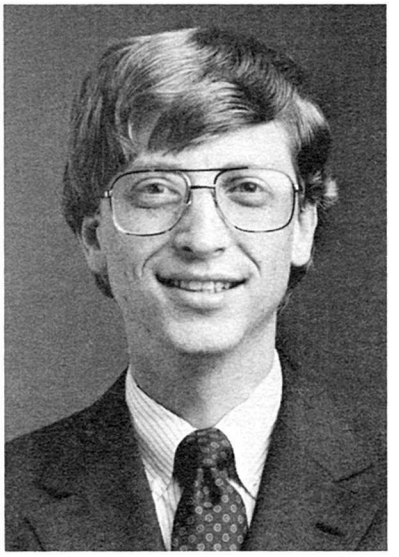
What disturbs me is that some people in the industry favor the notion that there are two categories of users: those who are computer users and those who are not. To my mind, that is an unfortunate distinction.

CD ROM might become a completely passive experience–you would only be able to read on it.

The advantage of a write-once CD is that you could load it up from different sources. You could design your own disk on which to store such things as maps, personal data bases, novels, travel guides, and business information.

Although memory chips are okay for storage, you can't load *War and Peace* on a single chip.

Another problem with CD ROM is that the screen technology is largely undeveloped. The flat screen of the mythical Dynabook has not been developed yet. Nor has the so-called readable "home viewer" screen that **Bill Gates** is fond of referring to.



"CD-I is a form of CD ROM," said Bill Gates in an attempt to convince the audience that the two standards are not miles apart.

Stranded Standards

Naturally, there was a great deal of talk at the conference about CD ROM standards. "In the future, every possible CD standard will predominate for five minutes," joked **Leonard Laub**, CD ROM pioneer and President of Vision Three, paraphrasing Andy Warhol's observation about everyone being famous in their own time.

There are currently several CD standards: the Red Book standard, the audio standard, which allows us to have music on the compact disk; the Yellow Book standard, which puts digital text data onto CD ROM; and the Green Book standard, the multimedia standard that allows pictures, text, and audio to be integrated on a single disk.

The controversy involves the CD-I standard announced by the two media giants at the Seattle conference. This standard enables disks to interact with a personal computer or a controller. On the computer side, we have retrieval software, which allows us to access information easily and fluidly. The CD-I standard requires the use of a real-time operating system called OS9 from Microware Systems Corp. of Des Moines, Iowa. The representative from Philips who announced CD-I at the conference said that the operating system could be made to work with CD ROM, but it is not clear how this will happen.

CD-I requires the Motorola 68000 processor, which is associated with the Macintosh, Atari, and Amiga product lines.

CD-I will be geared for the home

market, but the so-called High Sierra Group, a consortium of MS-DOS-oriented companies, think the CD ROM standard should be aimed at the business and professional markets.

The CD ROM Dream

"Where we are going, we don't know, but we are going there," said Borland President **Philippe Kahn**. Kahn's apocryphal one-liner summed up our general feelings of awe, excitement, and confusion about the direction in which the CD ROM odyssey will be taking us. If ever we needed a satellite navigational system for our CD ROM map, it is now.

Leonard Laub cited "strong desire and restless, rowdy energy to get there . . . which is indicative of a new culture booming.

I think Seattle is going to go down in CD ROM history as the birthplace of the collective vision behind this new technology. The town ought to be renamed "CD-attle."

Birth of a Notion

Gary Kildall's humorous keynote speech presented a different view of the historical and cultural development of CD ROM from what Philips would probably care to see recorded in the industry archives.

"Philips didn't invent CD ROM," Kildall said. "It's been around for a long time." He cited Captain James Kirk as having discovered the first X-rated CD ROM in an early episode of "Star Trek." A video clip showed Captain Kirk leering as he examined the silver disk presented by a space-age salesman, who said, "Choose your millenium. Choose your century . . . or a moment."

CD ROM Helper

Kildall struck a sensitive chord when he addressed certain quasi-ethical questions stemming from access to CD ROM data. He described the time his daughter had to come up with a school report about Costa Rica in one day.

Using Grolier's CD ROM encyclopedia, Kildall helped his daughter compile and cross-reference

> *"Within ten years there won't be an American middle-class household that won't have the equivalent of an Atari-ST and CD ROM."*
>
> Jerry Pournelle, *BYTE* columnist

13 articles on the Central American nation. The teacher was so impressed by the depth of the research that she gave his daughter an A+ for "her" efforts.

Kildall remarked that the next CD ROM application to be developed ought to be "auto-paraphrase" or "auto-plagiarize."

The New Knowledge

Kildall voiced some ideas on knowledge in the CD ROM age. "Knowledge doesn't have to be linear," he said. "It can run in any direction. Knowledge has a topography, a structure, and a flexibility of representation. It [CD ROM] can make a model of the way a person thinks."

The CD ROM Market

"There is a market for knowledge applications in a graphics environment–from the research librarian to the trivia buff."–**Robert Carr**, Chief Scientist at Ashton-Tate and developer of *Framework*

"By far, the area with the greatest concentration is the library market. [But] there are only 80 [libraries] that have revenues of over $100,000, and 30 with revenues of over $1 million. The wild card is the consumer area. There is a lot of excitement, but until there are proven track records in that market, it remains only conjecture. Interactive games, maps on CD, and satellite navigation systems are the most exciting areas."–**Ed Rothchild**, Chairman, Rothchild Consultants

"The hot areas are law, medicine, finance, education, and technical documentation. They are all ripe for existing materials."–**Gary Kildall**, President, KnowledgeSet

CD ROM Trivia

Current manufacturing costs for CD ROM are $1400 for 100 megabytes, and $3200 for 500 megabytes. A master disk costs $1300, and print runs cost $15 each per 100, or $5.95 each for 1000 disks.

It takes only 10 to 15 seconds to print 250,000 pages of text. However, **Ed Rothchild** noted that a company in Europe has developed a holographic method of production that reduces pressing time to only three seconds.

It is mind boggling to think of

being able to mail the equivalent of 250,000 pages anywhere in the U.S. with a 22-cent stamp.

LINK envisions a $2 billion market in CD ROMs, which is much larger than the generally perceived $400 million.

Masahiko Gotoh, International Marketing Manager of CD ROM for Sony, predicted that within four years all CD ROM manufacturers combined would be producing some 24 million CD-I players. When someone from the audience asked him about Sony's market share, he replied, "That depends on our customers."

There are 17 CD plants in operation around the world, with 44 more under construction. That number includes plants in China, the Soviet Union, and Brazil, where there is no current CD activity. Warner Communications is building a plant that will have the capacity to produce 14 million CDs annually. Hitachi is the only company that plans to make CD ROMs exclusively. All others are geared for both CDs and CD ROMs.

So far 28,000 CD ROM disks have been pressed, compared with 75 to 80 million CD audio disks. Over 11,000 CD ROM players have been shipped worldwide, and over 400 master disks.

The kiss of legitmacy is that the other big guys (in addition to Sony) are moving in: General Electric, Panasonic, Magnavox, and RCA.

"That means CD ROM will be a major mass industry," said **Stan Cornyn**. "They have as much place in the CD ROM marketplace as Apple, Commodore, and IBM."

Cost Plus ROM?

Interesting disk dynamics: A CD ROM might cost $10, but it might have $10,000 worth of information on it. So what will the CD ROM sticker price be?

Stan Cornyn sees multimedia disks retailing for $25. "We are going platinum all the way," he said.

> *"I don't think what Kildall is selling right now is worth $1000."*
>
> Stewart Alsop II, Publisher, *P.C. Letter*

Cornyn also noted: "The Aquatics, Science & Fisheries CD ROM is selling for $5000, excluding the drive. That doesn't drive sales."

Meanwhile, some information producers have actually had the crazy idea of inserting meters into disks. Others are willing to practically give the product away, but they don't want to jeopardize their on-line business.

I personally think that CD ROM should complement and expand the base of information services rather than shrink the market.

Applications

We need to have practical applications for CD ROM that go beyond data bases. Encyclopedias, educational training, interactive fiction for kids. . . Is that what it's all about–instead of creating computers that are going to change society?

Everyone at the conference was asking, "Why are we here?" At times, I thought, "There isn't any reason. We are all going to be turned into encyclopedia salesmen."

Bits and Pits

I bumped into *PC World* contributor **Adam Green** at the hotel registration desk. He declared mischievously: "*Windows* is all a big mistake. Microsoft is not going to do it. They are going to do CD ROM instead."

Leonard Laub said, "If **Carl Sagan** were here, he would point out that there are billions of pits on a disk."

Jerry Pournelle asked, "If CD ROM is already in the universities, how long before it gets to Beverly Hills? I predict that within ten years there won't be an American middle-class household that won't have the equivalent of an Atari-ST and CD ROM."

I asked **Bill Gates**, "When will IBM get involved?" Gates replied: "When I send **John Akers** a CD ROM player." Gates thought for a moment and said, "Gee, that's not a bad idea."

"It seems like everyone is trying to orchestrate a market that just isn't there yet."–**John Markoff**, computer writer, *San Francisco Examiner*

George Morrow, President and CEO of Morrow Designs, whose

OEM laptop for Zenith won the big IRS order, offered this computer oxymoron: "inventory control." I congratulated him on the contract, went home, and read in the *Wall Street Journal* that his company filed for Chapter 11. It was apparently a case of too little, too late.

Overheard during a coffee break: "Who really wants a musical encyclopedia?"

"I was suspicious. I understand that the Microsoft demo [CD ROM multimedia encyclopedia] is a kludge."–**Lee Felsenstein**, President, Golemics

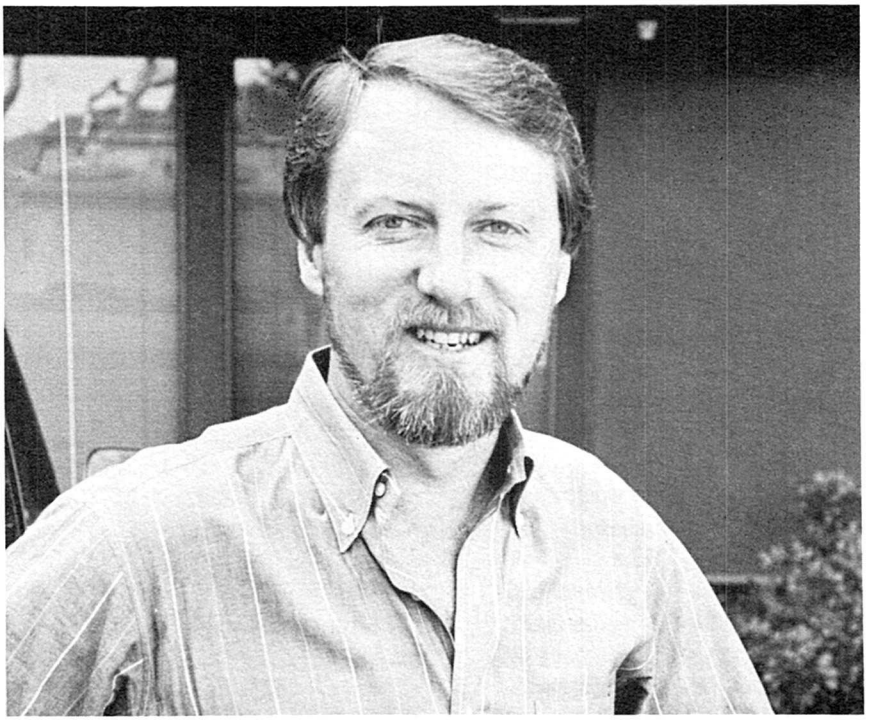
"When you think about all the work that went into doing just the Microsoft multimedia encyclopedia demo, to do one project from scratch would take tens of man years of work."–a Microsoft spokesperson

"It's like writing history with lightning."–**Woodrow Wilson**, after seeing D.W. Griffith's *Birth of a Nation.*

"We don't need the Griffith of CD ROM. What we need is the Jane Fonda of CD ROM. She made VCRs a success in this country."–**Adam Green**, *PC World* contributor

"I'm hearing a tremendous number of technical solutions for users, but there's not any convincing software. I see very little *1-2-3.*"–**Cary Lu**, Editor, *High Technology*

"CD ROMs are going to take longer than PCs to catch on. I don't think what Kildall is selling right now is worth $1000."–**Stewart Alsop II**, Publisher, *P.C. Letter*



"The hot areas [for CD ROM] are law, medicine, finance, education, and technical documentation."

Gary Kildall, President, KnowledgeSet

"If Microsoft takes everything it gets from the public offering and pours it into the multimedia encyclopedia, they'll do alright."–**Barry Richman**, Advanced Media Publishing

"If you take a third-rate product and put it on CD ROM, does it make it a first-rate product?"–anonymous, commenting on *Grolier's Encyclopedia*

"Do we have any plans to get into it [CD ROM]? I work for a company that moves very slowly in an area that's moving very fast. There's no

market for it yet. Grolier has got to sell a disk and player to make it work. Maybe in our lifetimes."–representative from *Encyclopedia Britannica*

"The thing that irritates me the most about this conference is that **Ted Nelson** isn't here. How can they keep talking about Hypertext and Xanadu, and he's not even here? He ought to have been invited as a speaker."–**Barbara Robertson,** *Computer Graphics News*

In the press room, **Lee Felsenstein** demonstrated *Sequitur* on a Compaq: "The program prompts the user with the last file used in that context. Some might call this 'artificial arrogance.' "

"We lost the computer revolution because we couldn't tell people at home what it [the home computer] is good for. Now there's a new revolution, but this time deliver on the promise."–**Doug Crockford,** designer of interactive entertainment, Games Division, Lucasfilm

"Those primitive yearnings found an unlikely reincarnation [in CD ROM]."–**Bryan Brewer**, President, Earth View

Renaming the ROM

What's in a name? Plenty, Rodolfo. In the case of CD ROM and CD-I, the question is: Will those dense monikers play in Peoria–or is Madison Avenue going to have to come up with something less seedy and more chummy? After all, names should have standards too.

In Seattle we conducted an informal survey among the CD ROM-ophiles to see if they had any poetic inspirations that they would want to share with us.

"I asked this guy at Philips, 'Is this a data VCR?' and he said, 'That's the right analogy.' "–**Fred Davis,** Editor, *A+*

"Datapac, infopac. . . . I like words like *universe, ocean,* and *sea.* How about 'three-dimensional information?' "–**Robert Carr,** Chief Scientist, Ashton-Tate

"Something with laser is good. Unfortunately, it has been used in about 400 different trademarks. I know–I did a search. How about LaserKnowledge?"–**Gary Kildall,** President, KnowledgeSet

"I think they are going to call it CD ROM, because that's what it is."–**Philippe Kahn**, President, Borland International

If anyone has a right-on, read-only name for CD ROM, send it to *Subroutines.*

Most Interesting CD Buzzwords

Bread Crumb Trails
CD ROM Jukebox
The New Papyrus
3-D Information
Auto-Paraphrase
Auto-Plagiarism
Artificial Arrogance
Glossary Button
Pop-Up Footnotes
Videograph
Hypertext
Hypermedium

On-Line Ontology

Fred Zappert, Manager of Advanced Technology Developments for Dialog Information Services, announced that Dialog is going to publish parts of their data base in CD ROM and combine it with on-line service. The idea is to store the historical data in CD ROM, announce the really hot items on-line, and integrate both.

I predict that that will be the wave of the future for on-line services. It gives consumers unlimited usage as they find data. As **Barry Richman** noted, "No one wants to pay on-line charges while they are thinking."

Will there be a battle between CD ROM and telecommunications? Or will the two technologies merge?

Panel Highlights

Here's the gist of the "Human Factor: User Interface Design" panel, one of the more interesting sessions at the CD ROM conference. The panel featured such CD ROM thinkers as **Robert Carr**, Chief Scientist at Ashton-Tate; **Peter Brown**, a professor of computer science at the University of Canterbury at Kent and President of Owl International; **Peter Black**, President of Xiphias; and **Philippe Kahn**, President of Borland International. Ixion President **David Hon** moderated.

It's going to be a lot more difficult to create the CD ROM interface than it

has been to develop interfaces for other computer applications that we are accustomed to. Most people don't realize this fact. That is one reason why CD ROM will take longer to join the information mainstream than some optimists would have you believe.

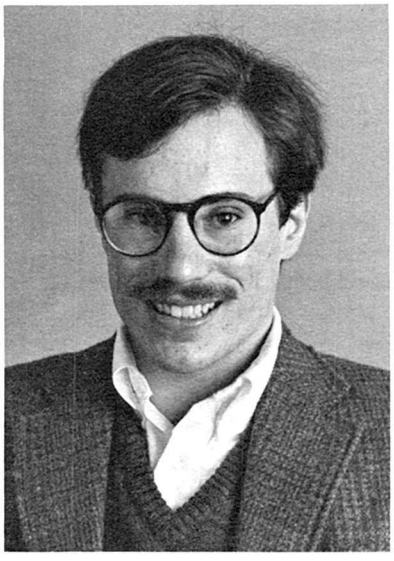
Word processing and spreadsheets are tools for generating information–not viewing it. With CD ROM, we need an interface that will allow for the consumption of information, not just the generation of information. What we need is a radically new user interface.

"Users need to move effectively through oceans of information," observed **Robert Carr**, who drew an interesting analogy to ice fishing. You hope to catch a fish, but you don't know how many others are down there or what the underwater environment is like. It's better to be a scuba diver in a coral reef and see everything around you in 3-D.

Most of the interfaces developed so far, including Kildall's KnowledgeSet, use a hierarchical structure–an outline, a tree, etc. That's alright, as far as it goes. But what we really need is a "nonstatic hierarchy." Users need to personalize, customize, and otherwise create their own lists, outlines, and structures.

Bread Crumb Trails

Carr, in what struck me as the most brilliant talk at the conference, offered the bread crumb analogy. "If you ever go through the forest, one way to recreate the route is by leaving a trail of crumbs. Our [CD ROM] users need bread crumb trails. But they also need the ability to shortcut trails, because you want to understand the context of other paths."



> *"Users need to move effectively through oceans of information."*
>
> Robert Carr, Chief Scientist, Ashton-Tate

The trouble with bread crumb trails, Carr noted, is that you are looking down at your feet and not up at the trees, which tell you about the path and about where you are going. You need to know more than key words. You need to create your own key words.

He noted that the old metaphors break down in the new CD ROM realm. He cited the old word processing metaphor of the papyrus scroll with the tunnel at the end. "Try to use the page down key to move down hundreds of megabytes," Carr joked.

Authorship Down

Peter Brown was on the same wavelength as Carr, but he carried it to an extreme. "There is no difference between authors and readers," the wacky Englishman claimed. He was referring to Owl International's software tool, *Guide*, an interface that allows the reader to tailor the screen to display just what he or she needs to see.

Readers can edit, control text, delete existing words, and otherwise merge their own language into any document or piece of literature. Hemingway would have loved Brown–in the bull ring.

Brown's front end to *Guide* was in the form of "one scrollable whole," laden with all kinds of buttons, including glossary buttons. However, as the old late-night television commercial for the button-fixing gizmo proclaimed, "The trouble with buttons is that they always fall off."

How long can *Guide* hang on to the practicality of its buttons?

"The most common mistake an author can make is not seeing the

world as the reader does. Clearly, an author can write incomprehensible rubbish in any system," said Brown.

Kahn Film Festival

"CD ROM, in a passive sense, could turn out like TV," **Philippe Kahn** warned. "It scares me a little. There is a moral issue involved. In the '40s, kids said they didn't need to go to school anymore, with [the advent of] TV, but look at what TV has done. It is associated with the growth of crime and drugs." He said it was the responsibility of CD ROM producers not to make that same "TV blunder."

> *"Publishers are going to be multimedia–or they are going to be dead."*
>
> Bernard Prost
> President, CEDROM Technologies

Kahn also pointed out the inherent dangers of CD ROM as a propaganda tool. "It's far more powerful and flexible [than anything before it]. Imagine the big lie of Hitler–being able to put it in pictures [in CD ROM]."

Sounding unusually apocalyptic for his rambunctious self, Kahn spoke out against standardizing a user interface. "The only standard we need is a retrieval system," he said. He noted that the coming developments in voice recognition would render the mouse, and even the keyboard, obsolete.

Kahn pooh-poohed the CD ROM obsession with browsing through Himalayan ranges of data. "If you're simply accessing dead data, it's not going to help you. Try to look at useful applications in the business world rather than just looking things up. Browsing is great, but there is work that needs to be done."

Remembrance of CD ROMs Past

While all the CD ROM gurus and visionaries were busy planning future incarnations of the system, it was interesting to note that some of the most current practical applications are already seeing the light of day.

Bernard Prost, President of Paris-based CEDROM Technologies, talked about an existing project with the French government to turn that country's census into CD ROM material. It would save the government a tremendous amount of money–about $1 million a year–as government agencies currently connect on-line to central computers.

Another project, to prototype in June, provides a focus on international trade between the U.S. and France. It's an expert-system, trade-exports data base that features pertinent trading information, including legislative rules related to trade and sample contracts.

Another CEDROM product strikes me as being equally tantalizing, practical, and original. It is a graphics data base aimed at advertising agencies in France. Want to tout your brand of beer? Now you can access all beer ads previously produced to check up on what your competition has done in the past.

"Publishers are going to be multimedia–or they are going to be dead," Prost predicted.

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SUBROUTINES
David Bunnell's Newsletter From Inside the Personal Computer Industry

VOLUME 5
NUMBER 5
MAY 1986

LASERLETTER

Comdex, Yawn

Atlanta Show Has Sizzle–But Where's the Beef?

It was as if the Cannes Computer Festival had been held at the spring Comdex in Atlanta–"Cannesdex," as one PC wag dubbed it. There was lots of show business and glitter, but no new blockbuster products were in evidence during the four-day computer show.

IBM premiered its "Chocolate Factory" stage extravaganza starring the actor who plays Charlie Chaplin in the TV commercials. SSI Software offered its *WordPerfect* 4.1 "All-Star Quiz" featuring comedienne "Joan Readers." Irwin Magnetic Systems dazzled the crowd with card tricks, and Basf, the floppy disk manufacturer, passed out shiny ceramic apple pencil sharpeners. "Take one home to your kids," they offered. "My kids don't use pencils," I replied. "They use computers."

The one offbeat show was at the nearly deserted Lotus booth. Only one guy was there, and he was watching the "Gotta Have Product Lust" picture. It was definitely L-rated. It also looked suspiciously like a Lotus recruitment film to me–and it was. **Bob Frankston,** Chief Scientist at Lotus, later confided that it was the only thing they had in the works that they could show at Comdex.

Just like at Cannes, some of the big-name stars opted to stay away from Atlanta this year. This was no doubt due to the increasing terrorism of skyrocketing show exhibition costs. "We lobbied with Apple for three months to try to get them to attend," said **Roland Bates,** president of Tangent Technologies, maker of MacBridge. "Their reason for not coming was that [Comdex] is too regional a show."

Spring Comdex in Atlanta may have had stars like Barbara Mandrell and the Temptations, but the VisiCalc of the future was nowhere to be seen.

Noticeably absent was Borland International. President **Philippe Kahn,** star of Borland's software box-office smash Turbo Prolog ("the first natural language of artificial intelligence"), was reportedly hiding out in Scotts Valley, California. Rumor had it that Kahn feared that **Mitch** "Moamar" **Kapor**'s terror squads from Lotus were out to get him.

Spring Comdex in Atlanta may have had stars like Barbara Mandrell and the Temptations at various parties, plus all the card tricks in the world to entertain us, but the *VisiCalc* of the future was nowhere to be seen.

Let the Good Times Roll

When I bumped into **Guy Kawasaki,** Apple's software evangelist, I asked him if he had heard anything about **Steve Jobs**' rumored entry into the software business with Next, Inc.'s first product. Guy replied, "If he brings it out, people won't expect it, and if he doesn't bring it out, no one will expect it."

More Dvorak?

Computer columnist **John Dvorak** is leaving *InfoWorld* to write for *PC Magazine*. Jonathan Sacks, Editor-in-Chief at *InfoWorld,* related how Dvorak said, "*PC Magazine* has just offered me $60,000 a year to write a column. What do you think?" Sacks shook Dvorak's hand and wished him good luck. A recent *InfoWorld* reader survey shows that Dvorak's "Inside Track" column has dropped to No. 5 on the list of the magazine's most read features. It used to be No. 1.

Rumor has it that **Jerry Pournelle**, the *BYTE* columnist who also writes for *InfoWorld*, will now move to the back page.

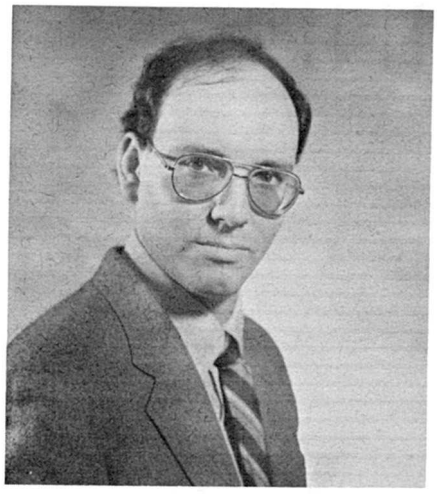
In the pressroom at Comdex, Dvorak was acting very bullish and aggressive. He is now producing 24 columns a month for a slew of publications. "And we're trying to talk him into doing another," says **Stan Veit**, Editor of the *Computer Shopper*.

The *PC Magazine* deal is not exclusive. "I'm not giving anything up except *InfoWorld*," Dvorak said. But Dvorak is not concerned about overloading himself. "My output is 600 printable words a day," he estimated. "I talked to [computer writer] **Danny Goodman**, and his output is 5000 printable words a day."

One of these days they will put all of Dvorak's columns onto CD ROM. They'll plug a recording device into his brain, and his thoughts will automatically be translated into columns. The program will be called *Auto-Dvorak*.

A ROM With a View

"We're probably one of the least organized exhibits here, but one of the happiest," exulted **George Riddick**, CEO of Marketing Graphics Inc. (MGI), as he distributed hastily put together presskits for *Storyboard* in the Comdex pressroom. MGI apparently just signed a deal with IBM for Big Blue to not only sell the *Storyboard* enhancement package directly, but also to distribute it to their own PC dealers. "We're probably the only third-party software they've got," Riddick said proudly.



'I would like SkiSoft Publisher to be the 1-2-3 of desktop publishing,' Ken Skier said with that future mogul look in his eye.

The WYSIWYG Slalom

I ran into Ken Skier, President of SkiSoft, who looked like the man who had swallowed the proverbial canary–or in his case the man who skied down Everest. He was in fine form and full of song. Ken's new product–code named *SkiSoft Publisher*–is what he calls a "spreadsheet for words." He has just signed a commitment with a major (rumored to be West Coast) publisher. "I expect a December release," Skier said.

Tony Bove and **Cheryl Rhodes**, contributing editors of *Publish!, The Magazine of Desktop and Personal Computer Publishing*, which is coming out in July as an insert to both *PC World* and *Macworld*, saw a sneak preview. They give it five raves. "On one side [of the screen] is the WYSIWYG display, and on the other side is a style sheet with menus. It can pop right into *SkiWrite* (Skier's word processing package), and it works very fast," they reported.

"I would like it to be the *1-2-3* of desktop publishing," Skier said with that future mogul look in his eye. "I never had this ambition before, but I've got it now. This is a brand new thing for me. I never wrote something that more than one company wanted. And I've also written stuff that no one wanted."

Ken Skier might become the next **Mitch Kapor**. Imagine that.

Sidecar Sideswiped

Is Amiga's Sidecar, the company's new IBM PC hardware emulator that is supposed to connect the Amiga to the PC office environment, XT incompatible? At the Commodore booth, the demo person had to call AAA for emergency road service. The Amiga engineer explains: "The hard drive is causing a magnetic field around this thing. There's no shield on it, is there?"

"So why does that mean I can't read that disk?" the Sidecar demo person demanded.

The engineer sighed, "The XT doesn't write it–this sounds stupid–as hard as the PC does. It's just the way that the drives are in the new XTs."

The Sidecar demonstrator went back to her screen display on the XT. "I'd like you to remember it's still an Amiga," she said. "The Amiga likes you to remember, too."

Red Tag Sales

The $795 sale on Amiga ended May 15. Will ailing Commodore Amigas edge their way up in the marketplace against Atari's more competitively priced STs? People at the Commodore booth handed out pamphlets showing some dozen or so software packages available for the Amiga. At the Atari booth, you get a fat 350-page catalog listing about 500 programs.

If Commodore extends its discounting policy on the Amiga, the machine might take off. But **Frank Leonardi**, Director of Amiga Sales, disagrees. "This is not going to be a relay race in which on May 16 there's going to be a brand new promotion."

Old Man and the Amiga

Although Amiga software may be scarce in the U.S., there are some 500 to 600 programs under development for it in Europe. One of the more intriguing games–they're all mostly games–is Italian. From Milan, probably conceived of in Harry's Bar, is a program whose name translates as *The Graphical Adventure of Hemingway Using Digitized Sound.*

It's in the area of business applications that the Amiga is furthest behind. The Atari ST has them in the bull ring. But I saw a data base from the UK (not available in the U.S. yet) that is a hands-down, brain-powered winner. It's called *Acquisition* and is put out by the Surrey-based Taurus-Impex Ltd.

The program offers both a relational and hierarchical data base with speech and graphics capabilities, featuring a maximum field size of 10 megabytes. "That means you can store in a field pictures, music, or a whole program," said Taurus Marketing Director **Peter Molyneux**. "You can store something like *MusicWorks* in one field, and in the other data base have the [complete] score."

Why these guys developed *Acquisition* for the Amiga and not the AT–which has maybe 10 sets for one Amiga–I don't know. You can't buy *Acquisition* in the States yet anyway.

Color, Color, Color

Tim Bajarin, Vice President of the Microcomputer Research Division at Creative Strategies Research International, shared some of his views at the "Electronic Publishing: Products and Integration" conference session: "One thing I discovered on the show floor is from a company called Howtek [from Hudson, New Hampshire] that has a thermal color printer with Xerox quality.

"Color printing is one of those trends that is going to be very important for desktop publishing. We're going to see a much more important role of color plotters and color printers taking a real stab at the presentation graphics market."

Charles Geschke, the Executive Vice President at Adobe Systems, concurred: "Color is a marketplace that wants to emerge."

The Paperless Office

John Zeisler, the Marketing Manager of Business Services at Apple Computer, shared his view of the mythical paperless office: "We believe today that the paperless office is an absolute myth. Information is doubling every 2 1/2 years. All your in-baskets probably reflect this. It might be a little bit better with some graphics, but there's almost twice as much as there was two years ago. What it all boils down to is, we're all under budget pressure to create more with better quality. And, of course, we all need to have it yesterday."

Desktop Publishing

According to **Charles Pesko**, President of C. A. Pesko Associates, the market for desktop publishing today is about $500 million, but he predicts that by 1990 it will reach $4 billion.

But no one is sure what this brand new category includes. "Definition is a problem in the desktop arena right now," noted **Bill McGlynn**, Product Marketing Manager of the Boise division for Hewlett-Packard. "None of us is nailing down a universal definition," he asserted.

Who are all the desktop publishers today? McGlynn believes they are virtually everyone who has a PC on his or her desk–not only graphic artists, but writers of manuals, newsletters, reports, research papers, memos, and even spreadsheet users.

The Slopes With Skier

Ken Skier is not your average oddball, even in an industry where eccentricity is valued as an important part of one's creative baggage. As well as being a programmer, he holds a literature degree from MIT. Anyone else with a literature degree from MIT, please raise your hand.

I predict that his coming desktop product, code named *SkiSoft Publisher*, will really take off.

> *'We're going to see color plotters and printers taking a real stab at the presentation graphics market.'*
>
> *Tim Bajarin, Vice President, Microcomputer Research Division, Creative Strategies Research Int'l*

Skier shared some swift observations about the emerging desktop publishing market. "A year or two from now, I expect to see page processing as part of any word processing package," he predicted. "Desktop publishing today is at the magnetic card stage. It will evolve at a tremendous rate, just as *Framework*, *MultiMate*, and *WordStar* have today."

Who's going to use desktop publishing? The average Joe end user, that's who, says Skier. He sees the

biggest change in desktop publishing coming from the gradual switch from professionals who used to do page composition to the average end user. But in the process, the terminology will have to be brought down to earth, he says. "Who knows what *kerning* and *ligature* mean?" Skier asked. You can't have the same approach to end users that you would to the professional community, he maintains.

PC end users shouldn't have to suffer inscrutable interfaces, he says. Just as any Mac product should have a natural Mac look and feel to it, PC desktop products should reflect the end user's product preferences. F1 should remain the help key, and Esc should still be the "get me out of here" key, for example.

Skier believes desktop publishing represents a great technological challenge as well as an enormous marketing opportunity. "Although people expected this Comdex to be the one where you see desktop products, that is not the case. Expect that [to happen] in another six months. Then we'll see the next wave of page composition. When that software appears, it will make sales of these gentlemen's printers take off."

The Apple, H-P, and Xerox folks on the electronic publishing panel didn't flinch at the prospect.

The WYSIWYG Debate

There's more to desktop publishing than meets the eye. During the question-and-answer session after the electronic publishing panel, someone in the audience made an important point: "You can't live with WYSIWYG alone. [Say] you're putting out booklets or product announcements that are 30 to 40 pages long. WYSIWYG is going to take you several days one page at a time. You're going to need to do batch work as well as WYSIWYG–and you're not going to be able to rely on defaults."

The Software Summit

Software Molehill is an apt description of this annual Comdex panel because the ideas were deflated, the solutions were flat, and none of the panelists had much energy or bite. Borland Vice President **Spencer Leyton** did a poor Philippe Kahn improvisation, suddenly snapping to from his lethargy to feebly castigate his fellow panelists before lapsing once again into somnolence.

Paperback Software President **Adam Osborne** played hooky. Software Publishing President **Fred Gibbons** was cryptic in his own inimitable style. **Enzo Torresi**, Senior VP of Product and Strategic Planning for Businessland, was uncharacteristically somber for his usual sardonic self. The panel just didn't have it. "Pricing Predicaments" was the theme of the software panel–falling asleep was the solution.

"The next biggest innovation in this industry might come from distribution, not technology," Enzo said wishfully.

Atlanta All-Star

I had originally invited Atlanta's mayor, **Andrew Young**, to be the speaker at PC World's dinner at the elegant High Museum of Art on Peachtree Street, but Young begged off, saying he had to sing in his mother's choir that night.

My second choice happily turned out to be more inspired. In fact, it was really a fortuitous break for the 150 or so CEOs, entrepreneurs, and manufacturers who gathered under the protective gaze of the African masks that looked down on us from the second-floor gallery.

Our speaker was **Michael Hollis**, the 32-year-old CEO of Air Atlanta, the airline that serves seven cities from Atlanta. Bucking the general airlines trend toward bare-bones discomfort, Hollis has pioneered a full-service airline with gourmet meals, complimentary in-flight drinks, free phone service, and the *Wall Street Journal* in all Air Atlanta lounges.

Hollis' inadvertent link to the computer industry is that he was a protegé of **Dr. John G. Kemeny**, the 13th president of Dartmouth College and co-developer of BASIC.

Drawing on his melodiously timbered voice, his apt turn of phrase, and a repertoire of first-class quotes, Hollis got the after-dinner audience off the runway with his rousing speech about America's entrepreneurial spirit. Some of the notable things he said were: "I learned long ago that liberty is not black or white, that liberty is not red, white, or blue. Liberty is green!" And, "Like death, taxes, and weak-kneed venture capitalists, doomsayers will always be with us–and they will always be wrong."

The audience gave Hollis a standing ovation, and he pumped hands like a contender at a primary. "I have seen the next governor," someone in the audience commented.

What's the Cajun?

You didn't have to pass the spice at **Ben Rosen**'s table. Rosen, the crusty, testy, feisty Chairman of Sevin-Rosen Management, has an opinion and an off-color joke for everyone's tastes.

"I hear you're going to open up a Cajun restaurant," I told him. "We decided instead of opening it, just to keep talking about it," he replied. "[That way] you get all the pleasure and none of the heartache."

Photo: Chuck Roger

'Active faith is a way of life for me. The true entrepreneur uses every waking hour to fulfill his vision.'

Michael Hollis, CEO, Air Atlanta

A Rosen Parable

So goes the story of the Venture Capitalist, the Hindu, and the Rabbi: Once upon a time, a venture capitalist, a Hindu, and a Rabbi were traveling together. It was getting late, and they needed a place to stay. They came to a farmhouse and asked to be put up for the night. The farmer said, "Okay, but I've only got room for two of you in the house. The other one will have to sleep in the barn." The Hindu volunteered, so the venture capitalist and the Rabbi settled down in the guest room.

After a few minutes, there was a knock on the door. It was the Hindu. "I don't mind sleeping in the barn," he said. "But there's a cow in there. It's against my religious principles to sleep under the same roof with a cow."

The Rabbi agreed to take his place. Off went the lights and back to bed. In a few minutes, there was another knock on the door. It was the Rabbi. "Sorry," he said. "I can't stay in the barn. There's a pig in there. It's against my religious principles to sleep with a pig." "Okay," said the venture capitalist, "you guys sleep here. I'll sleep in the barn." Off he went. In a few minutes, they heard a knocking on the door. It was the pig and the cow.

Dinner Tidbits

Contrary to market trends, **Ben Rosen** doesn't think much of desktop publishing as the next big revolution in the industry. As an investor in General Parametrics, creator of the *VideoShow* slide program, he's betting his money on presentation graphics.

According to Rosen, desktop publishing is a mere subset of the bigger picture. So naturally he parried with **John Zeisler,** Apple's desktop publishing marketing man. "There are features and there are featurettes," Rosen scoffed at the notion of a word processor with graphics capability. "And that's a featurette."

"Besides," Rosen pursued, "it's not prettiness that really counts–it's the information."

"That's right," agreed **Mort Rosenthal,** Chairman and Vice President of Marketing for Corporate Software. "Look at your napkin," he said, referring to the legendary drawing on a paper napkin that launched Rosen's greatest venture capital success, Compaq Computer Corp.

Pressed Duck

At Rosen's table was **Jody Rich,** the Aussie marketing man with Imagineering, the Sydney-based software distributor. Imagineering has the Southeast Asia exclusive on distributing Lotus. Rich recently returned from Hong Kong, where he took part in a big police raid on the notorious Golden Shopping Centre in Kowloon's Tsim Shau Tsui. Hundreds of pirates have shops there.

You can–used to be able, rather–pick up *1-2-3* for under $10, paying a couple of bucks more for the documentation. Pirated packages were on display like pressed duck in the windows.

"After the raid," Rich recounted, glorying in the operation's success, "a major international bank dumped its pirated copies and bought 110 [legal] copies of *1-2-3*."

Compaqability

"The [IBM Convertible] Portable is the third in a series of distinguished failures," Rosen quipped. "It's actually going to be a product you get fired for buying."

John Zeisler remarked that the Apple II would live on forever in the schools: "The IIe is going to be replaced by another Apple because of compatibility." Rosen snapped back with, "Gee, is that true in business, too?"

Ed Roberts proudly shows off his newest invention, DataBlocks. Behind him are his engineering technicians (from left to right): Charles Melvin, Rodney Carter, and Paul Toler.

It's a Draw

At another table, brothers **George** and **Paul Grayson**, the President and CEO, respectively, of Micrografx, almost got into a fistfight over the subject of whether in the future there would be multiuser systems–one computer with a number of terminals–or whether there would be networks of PC systems.

Their claim to fame is the popular drawing package *PC Draw*. Now they have introduced *In-A-Vision* and *Windows Draw*, the de facto drawing program for *Microsoft Windows*.

These two guys are really in cahoots with Microsoft. When they come up with a product idea for *Windows*, they tell Microsoft about it. If Microsoft tells them to go ahead with it, they know it's a good thing and rush to bring it out. If Microsoft yawns, they can the idea.

At dinner they heated up. George thought there was no need for multi-user systems because CPU chips are so inexpensive. So why share them? Paul disagreed, saying it's not the CPU chip but the box and everything that goes with it. Just as with the high-priced AT, you are looking at an expensive system–so why not share? George countered that in a multiuser situation, when the central unit goes down, everyone's work halts. With individual PCs, the work goes on.

This is a classic argument in the personal computer industry. These two guys, who are normally very friendly, were ready to kill each other. It took **Bart Rhoades**, President and CEO of PC World Communications, **Michael Hollis**, the Air Atlanta head, and myself to get them to cool down.

Enter Dr. Ed

It was great to have the industry entrepreneurs gathered together in a museum environment–a living collection of kinetic genius. Among the rarest of the Comdex exhibits was that of the legendary **Ed Roberts**'–now Dr. Ed Roberts–the father of the first personal computer, the Altair, who drove up from Wheeler, his ancestral county about 35 miles south of Macon, Georgia.

At six-foot-six, Roberts is a giant in more than height. I got my start in the computer industry working for his company, MITS, in Albuquerque, New Mexico, in 1974, when he brought out the Altair. A young **Bill Gates** wrote Altair BASIC for Roberts and then went on to transform it into Microsoft BASIC. Microsoft co-founder **Paul Allen** has since expressed a degree of remorse. And although **Steve Jobs** and **Steve Wozniak** claim that the Apple was the first PC, history books are now correcting those claims.

Roberts has not been idle since he left Albuquerque and disappeared into an almost Tibetan-like isolation in Alamo, Georgia, a 900-person bedroom community of Macon, where he owns over 700 acres of land. At the age of 40 and the father of six, Roberts entered medical school at Mercer University to become an M.D.

Roberts has developed a new product, DataBlocks (which is also the name of his company). It's showing all the promise of being just as revolutionary as the Altair was when it first came out. Ed used to do home computer kits, but now he's doing computerized home kits.

Welcome Back Ed

The spring Comdex in Atlanta was Ed Roberts' first computer show since 1977. He picked me up at my hotel in his brand-new Cadillac Seville. The air conditioner was on full blast all the way to Alamo, some 150 miles southeast of Atlanta on Interstate 16.

Alamo is sort of in between Macon and Savannah. To get there, you drive through a rolling stretch of pine barrens, an unending swirl of dusty green Georgia pines baking in the hot sun.

DataBlocks, Ed Roberts' first major venture since he launched the Altair personal computer at MITS over 12 years ago, is the only high-tech business in rural middle Georgia, where sorghum, rye, soybean, wheat, and peanuts are the usual crops.

For a while, as the reclusive Roberts pored over his medical textbooks and tended to his farm, he was forgotten by nearly everyone in the computer industry. Other Goliaths appeared on the scene, lifting seemingly heavier weights. Other Prometheuses carried much brighter flames, sparked by the original vision of the Altair PC.

Even his Alamo neighbors were perplexed by the chain link fence outside his converted barn/high-technology laboratory/office/production site as Roberts began to throw his energy into building his new company in 1984. There was even a rumor going around that Roberts was really a Russian agent sent to spy on Wheeler County. The satellite dish in his backyard seemed to be evidence that he was communicating with the Russkis.

Meanwhile in the PC world, rumor had it that Roberts had gone to medical school just so he could design some medical computer applications. In fact, during his four years at Mercer, Roberts developed a hand-held, computerized EKG machine as sort of a do-it-yourself heart monitor for heart patients recuperating at home. That was in his spare time.

Normally taciturn and not given to press interviews or self-laudatory PR hype, Roberts has only recently begun to come out of isolation in Alamo. The local newspaper, the *Telfair Times,* recently featured him in a front-page article with the headline "The Wizard of Wheeler."

"Roberts will go down in history as the man who brought computers to the people, just as Thomas A. Edison brought electric lights, and Alexander Graham Bell the telephone," the article began. But when it came to explaining Roberts' latest venture, the county reporter wasn't nearly as effusive: "DataBlocks are low-cost, electronic add-on devices that any person should be able to install and operate."

Data Blocks Debut

So what are DataBlocks anyway? And why does Ed–license pending, of course–refer to his new product as the Altair II?

"If you look at the PC now," Ed explains, "it's basically designed to allow you to generate custom software to do some job. Almost by definition, that means you're going to do some sort of accounting kinds of things, whether it's word processing or inventory control. About the only thing you can really control is the printer. Basically, the PC as it stands right now is not a device that's very easy to use to control special hardware.

"The concept of DataBlocks is that it's a computer designed from the ground up to be used to control external hardware. It's variable hardware as opposed to variable software. And it's programmable as well."

DataBlocks represents the very first accessible system for what Roberts has termed Personal Process Control (PPC). Essentially, it's a modular computerized control system that features stackable "blocks" that plug together in any customized combination, creating a kind of elegant high-tech totem. The user can actually "tinker toy" together a computer that is tailored to any specific application.

In keeping with the spirit of the first Altair, DataBlocks is an affordable medium. A DataBlocks system can consist of as few as two "blocks" or as many as 37. The basic system starts at $365 retail–that includes the CPU with vectored interrupts, real-time clock, front panel switches, and a terminal communications port.

The following blocks are also available: PROM and RAM Disk Blocks, Floppy and Hard Disk Controller Blocks, Parallel I/O, Dual Serial I/O, PROM Programmer, Stack LCD Display, and Stack Power Supply.

Special function blocks feature the Master/Slave Block arrangement. With only two wires–like a simple phone extension cord–you can plug up to 128 slave units, which are located at varying distances from the process that is taking place. With up to 64 master units and each master unit controlling 128 slaves, a single A-II can control over 8000 slave units.

Other function blocks include Stack Relay, DC Drivers, Dual D/A, Voice Recognition, and Voice Synthesizer. The individual blocks range from about $100 to $200.

The PCL Language

All this hardware is driven by Roberts' own user-friendly language, PCL (pronounced "Pickle," it's an acronym for Process Control Language). This is what makes it possible to monitor and control just about any mechanical or electronic device–from a toaster or milling machine to an ultra-sophisticated system, such as a high-rise control unit directing as many as 65,000 motors, lights, or solenoids.

PCL is basically the C language with enhancements. "It's designed so that an individual who has never programmed a computer will be able to write a process control program within one hour of starting," Roberts says. The operating system, A-II RT-DOS (Altair II Real-Time Disk Operating System) is CP/M based with a NSC-800 CMOS microprocessor–so you can use any of the hundreds of existing CP/M programs.

In fact, if DataBlocks flies, third-party software developers could write programs for customized or general "personal processes." All you would have to do is boot up your "Housekeeping Lotus" program, for example, and your spreadsheets would automatically calculate the correct number of drops your sprinkler system needs in order to water your lawn. Think of the savings on utility bills.

A New Power Tool

Power and portability are a breeze with DataBlocks. Low-power CMOS chips are used in all the blocks, meaning that you can run the system for up to 20 hours on four AA batteries. This fits into Roberts' interest in auto-pilot-type applications. For example, DataBlocks might be used to control a lawnmower, operate a tractor, or even dock a 70-foot boat.

Perhaps one of the most interesting concepts to emerge from DataBlocks is that it's not a step toward total evolution but a more symbiotic human-computer interface. "Our tendency has been to either not use computers or to build a wholly automated system," Roberts explains. "There's not a whole lot in between. That step from no automation at all to fully automated is very expensive and not practical in a huge number of applications.

"You're not really making a stand-alone robot," he maintains. "You're making a machine. I'm not sure whether you're integrating a computer into man or a man into a computer. But I think what you're really doing is giving man a very powerful tool. It's kind of an evolution like going from a hand drill to an electric drill."

What does Roberts see as the market for DataBlocks? "Ten percent of existing computer folks out there are probably good candidates," he says.

Does he have any competition on the market–say with Steve Wozniak's CL9 or General Electric's X-10 modules that control basic home functions? Roberts put his index finger and thumb together to form a round zero and shook his head to say no. "That's really a specialty market for the home environment. In fact, DataBlocks is a fairly low-cost way to get into the X-10 business. I don't see that as our major market. We've got more capabilities."

The big marketing question, of course, is whether history will repeat itself with Ed Roberts' latest creation. Will the hungry clones of the industry eat his product alive? Will it go the way of the Altair, with some media-sharp smoothie stealing his thunder and laying claim to the origins of the first PPC?

"I'm going to be willing to bet that somebody will make lots of money out of this PPC," Ed says, playing his own prophet. "They may change the name, of course."

Then he became somewhat more philosophical: "The parallel with the Altair is very close. Assuming I'm 100 percent dead right about this, the world won't realize that this revolution has occurred for probably another 18 months to two years.

"That was true of the Altair. We were getting lots of press and lots of interest, but we fought huge battles to get people to take us seriously. We'd call vendors and say we wanted to buy low-cost printers. They would ask, 'What are you going to do with them?' We would then say, 'We're selling computers to individuals to use in their homes.' They would inevitably hang up.

"If I described DataBlocks and told somebody we were building a personal control computer that an individual can use–that it's not very sophisticated to control a process that is unique to him but still needed to be controlled–people just look at you and say, 'Yeah, right, there's a big market for that' and walk off."

Roberts starts shipping DataBlocks this month. Welcome back, Ed.

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SUBROUTINES
David Bunnell's Newsletter From Inside the Personal Computer Industry

VOLUME 5
NUMBER 6
JUNE 1986

LASERLETTER

The Boston PC Party

Did Felsenstein Pre-Announce the 'Hacker's Mac'?

The Early Model Personal Computer Contest, held in May at the Computer Museum in Boston, had been characterized by the *Wall Street Journal*, the *New York Times*, and *USA Today* as a contest to find the first PC. That really wasn't what it was all about. Together with my fellow contest judges–**Steve Wozniak**, co-founder of Apple Computer and the president of CL-9, and **Oliver Strimpel**, the distinguished English curator of Boston's highly regarded Computer Museum–our mission was not so much to play industry archeologists as to pinpoint early evidence of excellence in the PC field.

We judged the 320 submitted entries of PC-related hardware, software, and memorabilia on the basis of quality, completeness, uniqueness, rarity, antiquity, and just how significant we thought they were. The idea was to enhance the Computer Museum's collection and thereby ensure that future generations remember the significance of early hobbyist computing.

The one thing that we didn't consider in great depth was the definition of *personal computer*. That question seemed fraught with danger.

We were purposely broad on this point. That's how we came to pick John Blankenbaker's **Kenbak-1** as the first-prize winner of the contest. It was, after all, the most significant personal computing device you could find in 1971.

John Blankenbaker enjoyed himself at the Computer Museum awards ceremony, which made the Kenbak-1 first-place winner in the Early Model Personal Computer Contest. In his acceptance speech, Blankenbaker recalled that he had developed the machine for classroom applications.

But was the Kenbak-1 really a personal computer? Blankenbaker certainly never called it a personal computer. It wasn't built around a microprocessor, it couldn't run BASIC, and it couldn't be interfaced to a terminal or to a paper-tape reader. Essentially, it was a machine whose function was to teach you how a computer works.

The other winners were Don Lancaster's **TV Typewriter** (1973), Lee Felsenstein's **VDM-1** (1975), Ed Roberts' **Altair 8800** (1975), and Thi T. Truong's **Micral** (1973). Robert Pond submitted the winning Altair 8800.

The Micral wasn't really sold to hobbyists and home users; Truong sold it to the French government to help monitor demographic information in France's African colonies. Although the Micral wasn't marketed as a PC, it had some remarkable similarities to the PC as we know it today. It had a bus system and cards–it could be expanded. Later versions featured floppy disks, hard disks, and software. The Micral was an amazing phenomenon, and bringing Truong's story to the world was important, so we made him a winner.

No one who knows the history of the industry can deny that the Micral was a catalyst for the PC revolution, although this fact is, for the most part, lost among the general population.

When **Ed Roberts** brought out the Altair in 1975, as he pointed out in his address at the June 14 PC Pioneers Day awards presentation, MITS wasn't just a fly-on-the-wall company. It was actually quite a large firm at the time. People used to refer to MITS as the IBM of PCs. MITS was also the first company to call its product a personal computer.

Of course, there will always be someone claiming to have developed the first PC–even if it wasn't called a PC. That's the hype of history.

Confidential Lee

Lee Felsenstein tried to be vague at the awards ceremony, but he let it slip during his speech about hackers and creativity that he's developing a new hybrid PC interface that promises to open doors and windows between the major rival operating systems.

"You will hear from me in the future about open architecture as the coming thing–not a past thing," was the first clue he gave. "Within six months, I'm going to be at least making a lot of noise about it, if not actually entering into production of some sort of device that relies upon open architecture [for the purpose of] survival and the improvement of the environment of personal computer development." A hacker in the audience reported, "I remember seeing in *Dr. Dobb's Journal* your name associated with the 'hacker's Mac.' I was wondering what's happening with that?"

Felsenstein turned a shade of red and replied, "That's sort of what I'm not telling you about."

Other clues from Lee (draw your own conclusions): "Topologically," Lee said, continuing his lecture at the party later that evening, "the PC universe is a dipole. One end has three branches: the Mac, the Amiga, and the Atari. The other end is, by a great margin, the PC. I'm going to make a Klein bottle of that."

Then apparently unable to reconcile his entrepreneurial instincts and his hacker's conscience, Lee offered to share his exciting secret with anyone who had brought a checkbook along. "$20,000 will buy me out of this one," he said. I think that's a cheap price to pay to get in on Lee's brainstorm.

Cancel the Clones

After I got back from Boston, where pioneers **Lee Felsenstein** and **Thi T. Truong** had discussed the future of compatibility (see "Putting on the Specs"), I heard about IBM Chairman **John Akers'** announcement that IBM will either eliminate the PC altogether or radically alter it to make it much more difficult to copy. Akers said that when the PC becomes a commodity item, IBM will get out of the PC business because IBM doesn't sell commodity products.

Although I don't think IBM will completely abandon the standard it set, I do agree with Truong that they will make it increasingly difficult for people to make compatible products. Perhaps they will come out with a new 286 machine with a smaller footprint, fewer slots, and a more complicated BIOS that will be next to impossible to duplicate.

About a year ago, I predicted that IBM would one day drop the PC and in that way illegitimatize the PC market. When IBM stops selling PCs, it will not increase everyone else's sales but instead will greatly depress sales.

IBM has to be a moving target if it wants to maintain market share. That's what the PC pioneers pointed out in Boston when they talked about open systems and compatibility. As Lee Felsenstein noted," Everyone else has to remain in fear of IBM and feel they have to duplicate, to the bit level, what IBM does. Only IBM doesn't have to do that." He concluded prophetically: "I'm getting out of compatible work. It's a dead end. "

Truong Tries Again

Thi T. Truong, the developer of the Micral, came from a very rich Vietnamese family. "There were only two classes in Vietnam," he explained– "very rich and very poor." He left Vietnam over 35 years ago, before the French were expelled, and he was educated in France. When he was 15, he was building radio crystal sets. He graduated from the École Français Radio-Électricité in 1959. By 1963, he was working in nuclear energy, although not as a physicist.

"All my life I was close to people who wanted to solve a problem," he said about describing his zeal for uncovering technological mysteries.

In 1969, he was awarded a prize for designing a new electronics system for detecting cancer of the pancreas.

Tired of working in a large company, Truong struck out on his own in 1971. "When I met a certain investor, Puisset, I presented a business plan. He said, 'Yes, we go' and then supported me from 1971 to 1978," reported Truong.

By 1972, the vision of the Micral (French slang for "small") was unfolding, especially after Truong made a trip to the U.S. and discovered what Intel was up to with its 8008 chip.

"The idea was coming slowly," Truong related. "There were two ways to solve [computing] problems: a wire system or the PDP-8. Between the two is a big gap. I had the idea of building a micro to solve the problem. The next idea was to make a general-purpose micro."

The Micral was born. Initially, it was built around the Intel 8008 and had 256 bytes of memory, expandable to 1K. It came with a keyboard and a video monitor and later evolved to the floppy and hard disk stage. By 1979, he could no longer finance the growth of the business, so he sold the Micral to the leading French computer maker, Bull, which now produces IBM PC-compatible Bull-Micrals. Last year, the Bull-Micral made a respectable European showing of over $200 million in sales.

Having sold the Micral for 100 million francs (at that time about $25 million), Truong became one of the early breed of French venture capitalists under the company moniker TTT (Total Telematics Technology). He's currently backing some six high-tech firms as well as his own product, Lasernet, an archival system using optical disks and scanners.

'A new era of graphics is coming. There is no limit to high-tech, not only in high-res but in high-speed.'

Thi T. Truong
Creator of the Micral

Truong Truisms

"I think the industry is stabilized right now around the IBM PC standard. I had a long dispute a few years ago with Jean-Louis Gassée. I told him the Mac would be a failure if it was not open. Now they decide to open it up."

"There is now in the world a trilogy that you cannot go outside: IBM, Microsoft, and Intel. If you're inside this trilogy, you can make a lot of things. You can design computers and make systems very easily."

"During the past ten years, the power of the micro has increased by a coefficient of 1000. By 1993, I think it will be 1000 again–the power will increase to 1 million times in 20 years."

Roberts' Rules

What is the definition of a PC according to **Ed Roberts**? "Since we coined the phrase," said Ed, "PCs have a special significance to us–as opposed to hobby machines, demonstration machines, industrial machines, development systems, or that sort of thing.

"Our theory [at MITS] was that it [a PC] had to be used with applications that are essentially typical of what you use a minicomputer or a big computer for. At the time, the [DEC] PDP-8 would have been a good prototype. A PC has to be affordable for the average person who would like to own one."

The PC needs to be easily interfaced with other devices. It should have a console that is relatively conventional, with a keyboard, CRT, or something similar. "It should have an operating system and have outlying storage," Ed said. Back in the age of the Altair, paper tape was considered an acceptable mass storage unit.

The PC should have a reasonably large memory. "We [at MITS] used 64K, mainly because that was the address that the 8080 had."

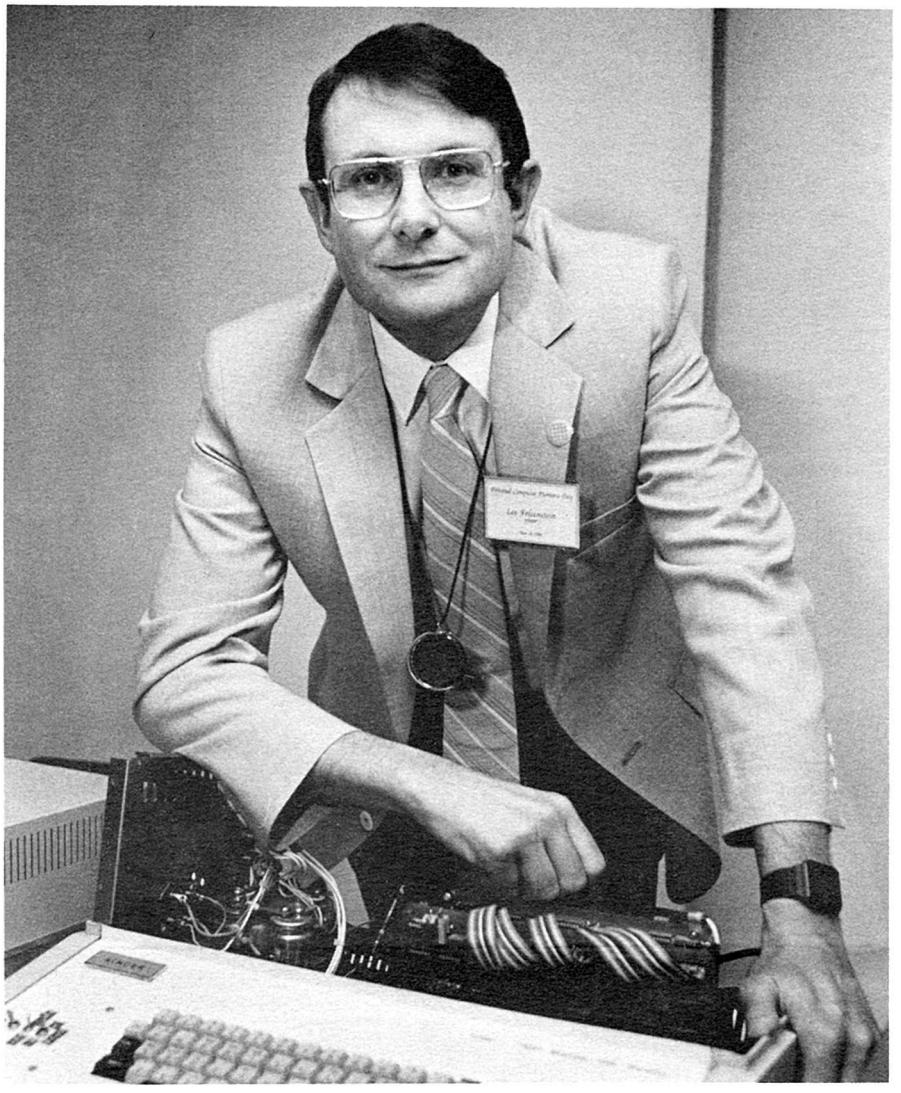
The bottom line? "I guess the final historical test," Ed said, "is was it used by a large number of people as a PC?"

After a period of over ten years of self-exile in Alamo, Georgia, Ed Roberts is back on the stomping trail with the introduction of his latest product, the Altair II DataBlocks system (see the May 1986 issue of *Subroutines*).

Buzzwords and buzz saws aside, look for Ed to once again hammer out the "definitive" definition of an emerging new power tool. He's coining this revolutionary technology Personal Process Control, or PPC.

Our Secret Weapon

In citing **Don Lancaster**'s TV Typewriter as the "opening shot of the computer revolution," Felsenstein heartily endorsed the creative principle that guided the early PC pioneers. "I can't stress the significance of this fact enough," he said. "We should explore that to the maximum extent possible. The open architecture process brings out America's secret weapon–hackers."



'The open architecture process brings out America's secret weapon–hackers.'

Lee Felsenstein, creator of the VDM-1

Felsenstein feels that hackers can make the vital difference in stopping Japan's monolithic thrust into our marketplace. "We've heard a great deal about the Japanese threat to American production facilities," he noted. "But they don't understand hacking. They are not going to outdesign us for the simple reason that we hack–they don't."

Although there are probably a lot of pretend hackers out there, Felsenstein says, even if "2 out of 1000 people come out smelling like roses, that's enough."

Computer Museum

Located on the Museum Wharf in Boston, just a tea bag's toss from the historic spot in the harbor where the start of an earlier revolution is commemorated, the Computer Museum houses more than electronic relics. It's more like an opium den for information addicts. It's the only museum in the world devoted solely to computers and computing. Since the doors opened a year ago, over 100,000

visitors from all over the world have roamed its four galleries, which house symbols of the the major eras of computing.

There you can witness the U.S. Navy's Whirlwind aircraft flight simulator/trainer, the first minicomputer, and an interactive exhibit representing ten years of developments in the PC industry. One gallery houses a computer animation theater, state-of-the-art graphics displays, and image-processing stations.

As you walk in the door, you see a humming, blinking VAX super-minicomputer, which powers all the museum's interactive exhibits. In addition to its various nonorganic exhibits, the Computer Museum offers an ongoing speakers program featuring prominent computer industry figures. Originally opened in 1979 by DEC, it's now a nonprofit organization. President **Gwen Bell** said that "one of the main things that the museum does is get history corrected."

Saved By the Bell

What on earth is a sonic digitizer? It looks like an aluminum tripod that fell off a roof or like something from an alien's barbecue set. **Gordon Bell**, one of the founders of DEC, came to the rescue: "It's a 3-D wand that can be used to sense in 3-D space by creating a sonic field." He thought for an instant. "But then again, maybe it's a spark digitizer."

On the Edge

The Bells, Gwen and Gordon, hosted a barbecue after the awards ceremony at their elegant yet rustic home in Lincoln, a suburb of Boston, where we ran into **Jonathan Rotenberg**, president of the internationally famous Boston Computer Society.

Don Perignon

What is **Don Lancaster** doing, and where is he? Don called me right after I got back from Boston to say he was sorry he couldn't attend PC Pioneers Day to collect his Early Model PC award for the TV Typewriter, the first terminal that could be interfaced to a TV set, which paved the way for CRT displays. (In those days, terminals had printers–but no screens–for output).

Turns out Don was in the hospital that day, but don't worry, he is up and bubbly in Thatcher, Arizona, where he has a company called Synergetics. Don has been working with Adobe and Apple on projects involving desktop publishing, particularly in the field of graphics. One of the things he does is create graphics using an Apple II and a LaserWriter, including the one shown here. These images are better than anything you can get anywhere else–even better than Mac graphics. He recently did a cover for *A+* magazine.

What's new at the BCS? "We're right on the bleeding edge," Rotenberg said proudly. "We've just started a CD-ROM user group, a music group, a LAN group, an Amiga group, two newsletters, and a public domain software group." They also started the Center for Computer Opportunities for the Disabled (CCOD). The CCOD performs a wide array of services. "From subtle things like moving power switches to braille systems and voice synthesis," said Rotenberg. "And elaborate graphics programs that a kid wrote using his big toe."

Pioneer Test

If you are a true PC pioneer, you should be able to recognize the following relics from the Computer Museum's permanent collection:

Ohio Scientific Model 600
Sony Sobax 2700
Sol Terminal Computer
Osborne Executive
Saga computer
Polymorphic 8813
Heathkit EC-1 educational vacuum tube analog computer
EPA Micro 68
Acorn Atom kit
Sinclair ZX80
Timex-Sinclair 1000
Nixdorf Model LK-3000
Commodore VIC-20
VIC 1001 with a Japanese keyboard
Dimension 4 (TI-99/4 prototype)
RCA Cosmac VIP
Kim-1
Intercept Jr. by Intersil
Jolt micro

Putting on the Specs

Chatting away after dinner were **Lee Felsenstein, Thi T. Truong,** and **Gordon Bell.** The main subjects under discussion were open architecture and compatibility.

Truong noted: "A new era of graphics is coming. We're going to see one chip working at 30 MHz with 2000 x 2000 resolution in less than two years. In my opinion, there is no limit to high-tech, not only in high-res but in high-speed."

Felsenstein countered: "True, there are no limits on specs, but what we've seen is IBM getting very complex specs and everyone rushing to catch up. The EGA was an incredibly complex spec, and for the life of me, I can't see why they did it that way, except to confuse people."

"I don't think IBM did it [set those specs] to confuse people," Truong retorted. "My feeling is that the engineer made the spec and others decided suddenly to accept it."

Felsenstein scoffed: "Well, that gives me some latitude, because if I don't decide I'm bound by that spec, then I can do something while everybody else is feeding at that diminishing trough. The question then becomes, what level of IBM compatibility is absolutely necessary?

Truong said, "I think that with compatibility you have to do exactly that and more, if possible, but never less."

"I spent the last two years in IBM compatibility," said Felsenstein wearily. "It's very frustrating, because you'll never be better than IBM."

"I don't agree," Truong replied. "It's very easy to be better than IBM."

Bell chimed in: "You can lead because IBM has no direction other than what it buys from everybody else. Whatever **Bill Gates** sells them, whatever Sytex sells them, whatever some random character comes up and sells them. That's compatibility."

'We lusted after computers, if that makes any sense–we were fascinated by them. Many people bought them because they wanted them, not necessarily because they needed them.'

Ed Roberts, creator of the Altair

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SUBROUTINES
David Bunnell's Newsletter From Inside the Personal Computer Industry

VOLUME 5
NUMBER 7
JULY 1986

LASERLETTER

From Here to Compatibility

IBM Seen As Losing Grasp on Market at PC Expo

The recent four-day PC Expo in New York–billed as the show for "volume buyers" of PCs and compatibles–might have been yet another nail in the coffin of Big Blue as far as that giant's grasp on the PC marketplace goes. This was the show that clearly signaled that the clones have finally grown up and are no longer tied to IBM's apron strings.

The day the show opened, **Jugi Tandon**, Chairman and CEO of Tandon, ran a smug two-page ad in the *New York Times* announcing his company's entrance into the clone market with XT and AT machines. The ad showed a group shot of Tandon's team, proudly plundered from IBM's top ranks–including **Dan Wilkie**, formerly site general manager of IBM's Boca Raton multi-facility manufacturing and engineering operations, and **Joseph Sarubbi**, who managed the development and manufacture of the IBM PC XT. Is there an IBM brain drain under way?

The PC Expo itself, held in the spacious glass cortex of the I. M. Pei-designed Jacob Javits Convention Center, was a rather subdued affair with little real volume to it. It struck me that the Fortune 1000 PC market has peaked out. From now on the market is going to become more and more small-business driven. Vendors are going to want to go after the onesie, twosie, threesie, and foursie guys because there are a million of them out there.

> *'The industry will very rapidly turn from no-name clones to full-featured, high-quality, name-brand equipment.'*
>
> *John Roach, President, Chairman, and CEO, Tandon Corporation*

The Roach Approach

"I shaved off my sideburns so I could be part of the effort," said **John Roach**, Chairman, CEO, and President of Tandy Corporation, referring to Tandy's recent injunction to its PC sales force to present a clean-shaven appearance in Radio Shack stores.

Roach, in his PC Expo keynote address, sounded like a cross between **Lee Iacocca** and **Clint Eastwood** when he challenged the clone riff-raff in the marketplace. "Go ahead and make my clone," he seemed to dare.

The Clone-Clones

In an apparent reference to Tandon's recent clone entry, Roach said of the clone-clones: "I believe that the attention of the industry will very rapidly turn from the transient no-name clones, such as the one introduced yesterday by a former supplier of Tandy, to full-featured, high-quality, name-brand equipment."

What About 1987?

"Yes, there will be a 1987," Roach replied, in answer to a question from the audience. "I've seen a few computer analysts who weren't sure if there is going to be a tomorrow. But there absolutely will be.

"Clearly, you will see introductions of 386-based machines from a lot of people, but I doubt that they will be terribly important to the marketplace during 1987. The two most important trends I see developing are the emergence of true PC-compatible home and home/business markets."

Four Seasons Forum

PCW Communications hosted a luncheon at the famous Four Seasons restaurant on East 52nd Street, where we put together an interesting panel for a small group of important people in our industry to talk about the nitty gritty issues of corporate computing. What are the main computing concerns of corporatedom? How do you manage to integrate PCs into the corporate environment? These and other questions were the main course of the day.

The PC Panelists

The very distinguished Four Seasons panel included **Carol Gorelick**, Director of Corporate Office Systems for American Express. She is chiefly responsible for providing office automation and PC training for the American Express community of more than 5000 professionals. The panel also featured **Larry LaBella**, Assistant Vice President of Citicorp, who is responsible for implementing PCs throughout Citicorp's empire, and **Michael Rosen**, the Technology Development Manager for the *New York Times* who implements special equipment as well as general-purpose PCs.

Rosen is currently very interested in highly interactive display advertising equipment that uses graphic arts quality integrated workstations. The fourth panelist was **Keith Hubbard**, Director of Information Resources for Milliken, one of the world's largest textile firms. Milliken has the reputation for being involved in research and development as well as introducing new technologies to its operations.

'There is such a thing as too much hand holding by the instructors who teach people to use software programs.'

Carol Gorelick, Director of Corporate Office Systems, American Express

AI Front Ends

Gorelick cited managing technology as one of the biggest problems in implementing PC training on the job. She said that although American Express conducts many training programs, "There is such a thing as too much hand holding by the instructors who teach people how to use the various software programs. When they go back to their offices, they don't know what applications make sense to do on a data base package or what you can use on a spreadsheet."

To resolve this dilemma, Gorelick suggested that vendors put AI front ends in their software packages to help people decide when it is appropriate to use a particular program.

Some other useful ideas: Because American Express applications involve a great deal of inventory work, Gorelick suggested that there ought to be more inventory-oriented integrated packages. They should be easy to access, perhaps even using mnemonic gateways that would allow users to bypass the menus. She also noted that some American Express employees would like to see concurrent use of spreadsheets, particularly in the budgeting cycle.

She also offered her product wish list for Christmas: "We would like to have an effective compatible and a very low-cost laptop computer."

Of the most disappointing purchases that Gorelick mentioned, "The one that comes up over and over is *Symphony*. The other is the XT. The XTs are too noisy. We replace the drives again and again. And the Grid laptop has been a disappointment in price and performance for a long time."

The Future

"PCs are going to become important as the mainframe function changes," Citicorp's **Larry LaBella** observed. "[We see] data moving out of the mainframe into the local PC."

Hot Products Wanted

There is a bona fide software tool that Citicorp would love to see developed, because it would solve a huge, potentially expensive headache for this megacorporation. "We have an operating system on the PC where there is one date for every file," LaBella noted. However, the problem is that the date of the last update is not the date on which the file was created–it's the date the file was last changed.

"This is the kind of scenario people worry about," LaBella related. "The person who used to get a report on his desk every two weeks doesn't anymore. He has a PC. He calls up the mainframe, pulls down the data, looks into a spreadsheet, plays some what-if games, overwrites the formula with a number, plays some more what-if games, takes the data, and goes on vacation. Then he comes back, pulls down some more data, and merges it with the old data. How old is it then? It is not really comparable for doing the same spreadsheet. Then he makes a $600 million acquisition. We would like to avoid that."

The Three D's

The big three are data security, data ownership, and data integrity. This is a key issue that corporations like Citicorp need help in dealing with, according to LaBella. "Some of the solutions have to be ours," he said, "[like] explaining to our people and educating them about what can and can't be done on the corporate PC."

For example, LaBella noted, it's important to "explain the fact that three people can't update a file one after the other, and the fact that only the last file will be the one to stand."

Where's the Bug?

"Please treat us as professionals," LaBella pleaded to the software developers at the luncheon. "Tell us about bugs. Don't let us find them. We have maybe 100 people scattered around the company who spend a day each finding bugs you know about. Let us know about them–it's okay for software to have bugs."

Bug-Proofing

So who covers the cost of debugging software? There were a couple of ingenious ideas proposed at the panel about how to deal with this annoying and costly problem. **Carol Gorelick** had a terrific idea: "We think the solution is to partially site license electronic distribution to [large companies]. You would download to a technological support center of some sort, and they would have the responsibility of deciding to dupe [the corrected version] on an electronic bulletin board."

'Tell us about bugs,' Larry LaBella asks of software developers. 'Don't let us find them. We have 100 people who spend a day each finding a bug you know about. Let us know about them–it's okay for software to have bugs.'

Mixed Shop

"I run a mixed shop," LaBella stated. "I always will. I'm going to have some of everything. If you don't work with my mixed environment, I can't use you. Even if you are the one who did it the right way."

Desktop Delights

New York Times' **Michael Rosen** looks forward to desktop publishing. "We have been involved in a spectrum of sophisticated desktop publishing," he related. "We are paying a lot of money for that equipment. I feel that in the next two years, we are going to be able to do the same functions for which we have been spending about $100,000 per terminal–for about $2000."

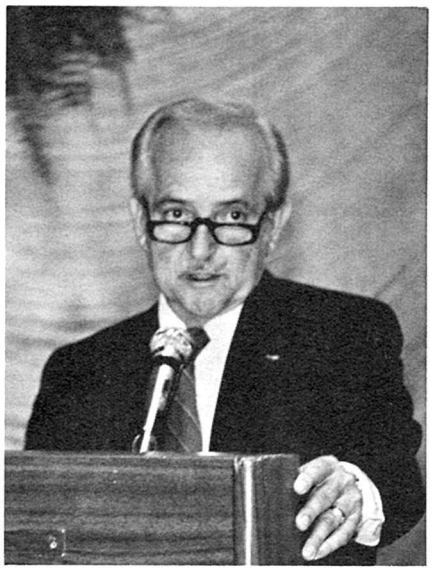
Milliken's Silicon

According to **Keith Hubbard**, Milliken would like to see advances in the following areas:

Multi-tasking: "We would like to see a PC that will allow you to attach several workstations for less than $1000 apiece. I think there is a tremendous market for this. We are currently using mini-slave terminals in that regard, but I would like to have an IBM product."

Networking: "We have 60 VAX computers in our company and hundreds of terminals. I would like to have every terminal in our company communicate with every other terminal. That is an industry-wide problem."

The perfect laptop: "We need a laptop that is lighter–and something you can read. We have hundreds of salesmen out there who need this thing."



'We would like to see a PC that will allow you to attach several workstations for less than $1000 apiece.'

Keith Hubbard, Director of Information Resources, Milliken

The Transparent PC

Hubbard believes that in the corporate environment the PC has "about hit everybody who has been fascinated by it. We've got to get to the people who don't want to use them," he said. "They are the ones who we need to address now. PCs have got to be more than user-friendly. You have to be able to use a computer in two hours instead of two weeks."

The Klutsy Edge?

"How far would you say your firms lag in technological movement?" was one of the questions posed to the panelists.

"That depends on what part of the company you are talking about," responded **Michael Rosen**. "There are certain areas that are still using basic software, and other areas that are developing PostScript applications."

"In the Citicorp environment, we have programs from packages that walk hand in hand," remarked **Larry LaBella**. "You want to grab something as soon as it gets to market. Anything that gives you a competitive advantage, we grab as soon as we can grab it. We have groups who happily seek out almost a partnership with vendors trying to work on products before they get to market. We are interested in using new technology when we can."

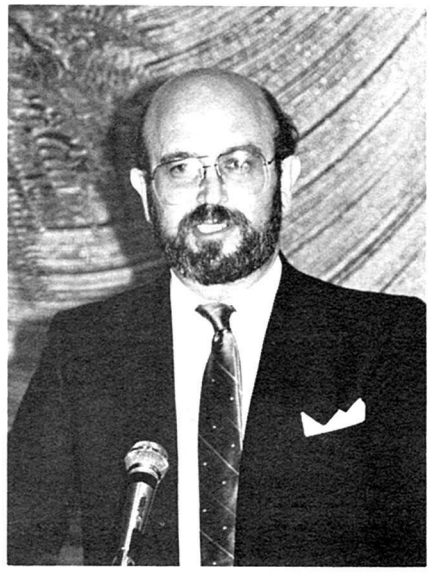
Carol Gorelick concurred: "We have advanced technological groups and business units that survey what is available with the corporate view to implement it over a large number of people immediately."

The PC Payback

Another question that interested us was a practical one: How closely do corporations monitor productivity and payback when they contemplate setting business standards?

"It depends on the individual manager and the business unit," Rosen observed. "Some think that new technologies are done without any payback, short of the competitive edge. We have a real issue in how to audit payback and in doing a good audit successfully. I think you justify everything and centralize what is happening."

Meanwhile LaBella demurred: "To a large extent, we don't even try to cost-justify it. On a personal productivity level, a PC really costs about what a telephone costs. It doesn't take much use of this thing to justify it as a productivity improver. But on a broader level, I think we are getting better results because we are using PCs."



'We have been involved in a spectrum of sophisticated desktop publishing. In the next two years, we should be able to do the same functions for which we have been spending $100,000 per terminal–for $2000.'

Michael Rosen, Technology Development Manager, New York Times

PC Excellence

Who would have thought a year ago that an unknown software company from Orem, Utah (then called SSI Software and now rechristened WordPerfect) would dominate one of the major software categories in the 1986 World Class PC Contest–namely, word processing.

For three years running–1982 to 1985–*WordStar* from MicroPro was the nation's No. 1 selling word processor. It was the standard in word processing. Our first three World Class PC Contests bear this out. Up until now, WordStar was the undisputed king of the word processing universe.

The annual World Class PC Contest, in which *PC World* readers vote on the best software and hardware products in 39 categories, is an important measure of PC excellence. Unlike the contests of some other computer magazines, which tend to play up the favorites of the editors, the World Class PC Contest reflects the personal choices of real PC users.

The complete list of winners will be published in *PC World* in October. Meanwhile, here are some advance insights:

Our fourth World Class PC Contest revealed that *WordStar*, which parallels the misfortunes of MicroPro, is on its way down. Its star has slipped to third place, with a mere 12 percent of the vote. Compare that to 1983, when *WordStar* gathered 40 percent of the *PC World* readers' vote.

Only a year ago, conventional wisdom thought it impossible for an unknown company to compete in a major software category. Only the well-known giants are supposed to have any chance of dominating these categories, which include word processing, spreadsheets, data base, and communications.

WordPerfect has this year captured 22 percent of the readers' vote in the word processing category, and mighty *Microsoft Word* weighed in at a distant second, with 14 percent of the vote.

Why Did Mitch Kapor Decide to Log Off?

It's hard to believe, but psychology student **Mitch Kapor** is sincere when he says he resigned as Lotus chairman because the time had come for "an intentionally unstructured period."

The guy has already cashed in $50 million of his Lotus stock and still has $54 million left to siphon off for who knows what. A mansion, a year-old son to play with, and a corner on the Hawaiian shirt market–not much to complain about.

PC World East Coast editor **Eric Bender** interviewed Mitch shortly after his bombshell announcement. Kapor was exceptionally coy except to say that he is interested in looking at "non-software areas of technology" and that "when they make the movie [about Lotus]," he should be played by **Dustin Hoffman,** and **Robert DeNiro** should play the part of Lotus President and CEO **Jim Manzi.** If this tells you anything meaningful, please write us.

Knowing how zealously Mitch guarded Lotus mythology, it would not surprise me to find out that he is already at home writing the script in *Symphony* with an attached production budget and a bar graph projecting ticket sales. *Mitch: The Movie* is coming soon to your PC screen thanks to Intel and AST for breaking the 640K barrier.

At the time of the big announcement, Lotus was running the following advertisement in the PC Expo show guide that portended to be a definitive statement on leadership. I doubt if Mitch himself was the author, but I found it rather ironic.

Leaders innovate.
Leaders grow.
Leaders listen.
Leaders respond.
Leaders have spirit.
Leaders have imagination.
Leaders take risks.

Leaders are committed.
But most important,
leaders don't forget to lead.

Lotus

MultiMate, which I thought would have ranked much higher, got a mere 5 percent, putting it in sixth place.

While the IBM AT not unexpectedly won in the desktop computer category, with 31 percent of the vote, it was surprising to see how strong the Compaq Desktop 286 really is. It came in second, with 18 percent of the vote. That is quite an impressive showing.

The only other non-IBM PC ranked highly by *PC World* readers was the A&T 6300, which won 6 percent of the vote in the desktop computer category.

Not unpredictably, the Compaq Portable 286 was voted the most desirable transportable computer. In fact, Compaq computers dominated this category, garnering 80 percent of the total vote.

The closest race for the best product was in the graphics board category, reflecting the intense competition between IBM and Hercules. The IBM Enhanced Graphics Adapter won, with 19 percent of the vote, but the Hercules Graphics Card came in closely behind, with 18 percent.

Lotus *1-2-3* still owns 69 percent of the spreadsheet category. When you throw in *Symphony*, Lotus' total comes to a thunderous 75 percent. At the opposite end of the spreadsheet spectrum, was **Adam Osborne**'s *VP Planner*, with only 3 percent of the vote. *VP Planner* may be new on the map, but somehow 3 percent does not seem like a very huge market for an under-$100 product.

Another interesting development: Ashton-Tate's *Framework* has overtaken Lotus' *Symphony* in the integrated software category.

Meanwhile, Living Videotext signaled its domination of the outline processing category, with *ThinkTank* commanding 31 percent of the vote, while *Ready* mustered 16 percent. This gives Living Videotext 47 percent of this emerging new category.

For the first time, the World Class PC Contest featured a "most promising newcomer" category for software. *Turbo Lightning* from Borland won, while *Javelin* hurled in at No. 2. *Javelin* also came in second, with a respectable 14 percent of the vote, in the financial modeling category, trailing *1-2-3*.

Although there were many repeat winners from 1985 in these categories, and even a few who have won for more than two years in a row (Ashton-Tate's *dBASE* has won four consecutive times), the World Class PC Contest clearly demonstrates that there are still changes going on in the software industry. There is still room for new players, and the old players who have previously dominated the list, such as MicroPro, can slip.

Perhaps the PC world is not as volatile as it once was, and perhaps the turnover isn't as fast as in preceding years, but it's still as dynamic as ever. If you look at Living Videotext, WordPerfect, and Borland as examples of companies that started off as small entrepreneurial software firms, you can see that they have blossomed because they have put out super high-quality products.

"It feels really good to beat *WordStar*," said WordPerfect President **Alan Ashton**. "We have felt all along that we had something better to offer. For us to be recognized by the people who use word processors, and to have our work vindicated is a very satisfying feeling."

It really is an achievement to win in an established category that has lots of competition–including IBM.

What about IBM? Big Blue failed miserably in the word processing category–they didn't make the chart. They didn't even get one percent of the vote.

What the Heavy Hitters Want to See

* High-interface display advertising equipment utilizing graphic arts quality integrated workstations
* More connectivity
* AI front ends for personalized software applications
* Inventory-oriented integrated packages with mnemonics built in to bypass clunky menus
* Concurrent spreadsheets
* Low-cost, effective, compatible laptops with readable screens
* A software tool that helps keep a trail of file changes
* Truth about bugs
* Multitasking workstation environments
* Transparent PCs for computer-intimidated users
* Partial site licensing to electronically distribute updated versions and debugged software via electronic bulletin boards

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SUBROUTINES
David Bunnell's Newsletter From Inside the Personal Computer Industry

VOLUME 5
NUMBER 8
SEPTEMBER 1986

LASERLETTER

Mac to the Future

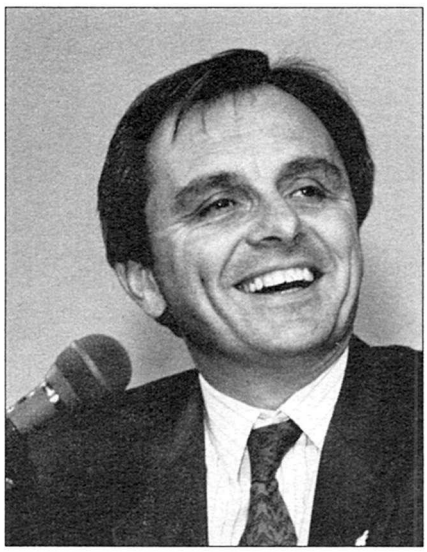
Apple's Macintosh Comes Roaring Back

Funny how the winds have shifted, how the tide has turned, and how the PC pendulum has swung. Only a year ago, the Mac was "dead meat" in corporate America, as **Will Zachmann**, IDG's Vice-President of Marketing, noted during the keynote panel at the recent Macworld Expo in Boston.

Now we are starting to see more than just a turnaround. We are witnessing an astonishing transformation and a strategically successful repositioning of the Macintosh in the corporate marketplace.

With the advent of desktop publishing, which Zachmann likened to "Apple's Inchon landing behind enemy lines," the Macintosh has parachuted to glory. It has retaken Pork Chop Hill, hoisted its victorious flag high, and routed the enemy hordes in their drab blue uniforms.

Apple Computer CEO and President **John Sculley** recalled that last year's Boston Macworld Expo was the turning point for the Macintosh. Prior to that, industry watchers were telling him that the Mac might not make it to Christmas. Mac sales were so bad that everyone in the industry was giving it very little chance for survival. Then the 1985 Expo opened with such a burst of enthusiasm and excitement that the gloom and doom dissipated.



'The mainframe is not the sole repository of knowledge.'

Jean-Louis Gassée, Vice-President of Product Development, Apple Computer, Inc.

That enthusiasm has always been there from day one among a hard-core group of supporters consisting of developers, programmers, and otherwise religious Mac zealots. Their explosion of support gave people at Apple the momentum they needed to carry through on their faith that they were indeed going to make it.

This year's Macworld Expo was the pay-off on that faith. It proved that the Mac pioneers who had struggled so hard are going to make lots of money. Look at **Dave Winer**, President of Living Videotext, who sold 6000 copies of *More* in the first two weeks after its release. The show was replete with examples like that. There is a market for Mac software, after all. And isn't it ironic that at a time when there is so much excitement in the Macintosh market, suddenly things seems so gloomy in the IBM world?

Cray On!

An amusing bit of humor heard in Boston: Apple bought its Cray computer, the fastest and most powerful computer in the world, to help them build the next-generation Apple. Meanwhile, over at Cray, the designers bought several Apple computers to help them build the next-generation Cray. Fair is fair.

It's in the Software

Ready Set Go, *LetraPage* (formerly *MacPublisher*), and *PageMaker* are all coming out with new versions. The promise of desktop publishing is finally coming true. Although everyone seems to think that the Macintosh-LaserWriter duo is what really made desktop publishing, in actuality the software is the driving force behind the desktop publishing phenomenon.

The division between word processing and page makeup is becoming fuzzy. The major word processing programs, such as *Microsoft Word*, *WriteNow*, and *Haba Word* want to add rules, kerning, and automatic hyphenation, while page makeup programs are moving toward full text editing capabilities. The all-in-one desktop publishing/word processing program is close at hand.

We are also beginning to see new desktop hybrids–combinations of scientific, engineering, and financial applications built into desktop publishing programs. Where once you had an individual spreadsheet, a word processor, or a batch-oriented typesetting program with WYSIWYG features, all the boundaries are now being washed away. Orange Micro's *Ragtime*–which offers word processing, spreadsheet, forms generation, graphics, and page layout capabilities in one integrated environment–is a prime example of the New Improved Age of desktop publishing that is about to inundate the marketplace.

Applications are becoming more complicated, all right. They do more, but they are still easy to use. It's sort of like crossing a zebra and a rhinoceros. You are going to end up with quite a mythical beast. The desktop jungle will be full of such wonders. Wait and see.

'The Macintosh office system is not here yet, but it will be.'

Bill Gates, Chairman, Microsoft

Follow That Cab

J. E. Arcellana, Associate Editor of *Publish!*, shared a cab from Logan International with **Andy Hertzfeld**, the Macintosh software free spirit. Here is an on-the-spot report:

"Andy was wearing a post-Flashdance faded fuchsia sweatshirt, with its sleeves scissored off. He said that he thought the new open Mac would be too expensive, not that radical, and therefore not that exciting. The Radius monitor that he helped design is really cool, of course. According to Andy, desktop publishing, as it is now understood, will not happen on the Apple II. It doesn't make sense for developers to make it happen with the Macintosh around."

On the Big Screens

Three big Mac screens made their debut at the Boston Expo, giving us a preview of what is to come: Micrographic Images' 20-inch MegaScreen, E-Machines' 17-inch The Big Picture, and perhaps the most exciting one, the 8 1/2- by 11-inch Radius, which was developed by **Andy Hertzfeld** and **Burrell Smith**. If you use the Radius, you can use both it and the Mac screen at the same time–a real double header, all right. More evidence that the Mac is emerging as a real alternative to the IBM PC.

At the Meridien

MacroMind, the developer of *ComicWorks*, *VideoWorks*, and *MazeWars*, celebrated the fact that the rights to their products were back in their hands after the dust settled from the sale of Hayden Software to Spinnaker. The party they had was so boisterous that the Hotel Meridien, where it was held, closed them down for breaking every rule in the book, including making too much noise, having drinks brought in from outside, too many people attending, and obviously, having too much of a good time.

At the party was **Wes Thomas**, the self-styled gonzo publicist who declared that the time had come for "AI literacy."

Give Me More

Living Videotext's *ThinkTank* on the Macintosh was a popular program, but a lot of people criticized it because it didn't follow the user interface very well. Now brothers **Dave** and **Peter Winer** have redeemed themselves with their newest program, *More*, which is "more" than outlining package. They have even coined a term, "desktop presentation," to help buzzword it into the marketplace.

More is a hot property. The Winers claim that it will do for desktop presentation what *PageMaker* did for desktop publishing. For example, it can outline and automatically create an organizational chart lickety-split, right in the conference room. During many of the conference sessions at the Macworld Expo, a number of presenters were already putting the program to use.

Hot Tip

Expect to see Apple come out with a file server by the end of the year, according to an unnamed source who heard it from another unnamed source. It's a couple of years late, but better late than never. Of course, this will be the key device in Apple's networking desktop communications strategy.

Master PCs

At the *Macworld* dinner held at the Boston Museum of Fine Arts, over 100 guests dined amid priceless impressionist paintings. Gauguins, Van Goghs, Monets, and Cezannes hung just a few feet from our tables. **Peter Winer,** Vice-President of Product Development at Living Videotext, was admiring a Gauguin mural that showed a group of Tahitian bathers. "I bet those bathers didn't have to decide whether to buy a Mac or a PC," he opined.

The F.Y.I. O.D.

Bill Murphy, Vice-President of Finance at IDG, was discussing the perils of electronic mail over dinner. IDG has an international E-mail network among its more than 40 computer publications worldwide. Murphy remarked that E-mail is certainly wonderful, but that it has one major drawback: It has become so easy to send F.Y.I. memos that you have to dig through hundreds to find the ones you want to read. The system is clogged up with too much information.

Turbo Philippe

Borland's outspoken President, **Philippe Kahn**, recently introduced the Macintosh version of Turbo Pascal. In attendance at yet another premiere was **John Sculley**, whose presence signified Apple's desire to align itself strategically with right-stuff companies. Turbo Pascal has sold more than 400,000 copies on the IBM PC, and Kahn predicted, in his inimitable fashion, that the Macintosh version would become the most popular version of any kind of software on the Macintosh.

Borland also added Singular Software's *Interlace* to its line of Macintosh products, renaming it *Reflex*– even though it bears no resemblance to its IBM PC counterpart. Philippe definitely feels that the Macintosh is ripe for picking.

Wheels on the Bus

Bill Campbell, Executive Vice-President of Marketing and Sales at Apple, was asked at the keynote panel about what kind of bus the "Open Mac" would have. Campbell refused to answer. However, we know from an item in the August issue of *Computer Design* that Apple has approached Texas Instruments about using TI's NuBus as the open-bus architecture for the Mac. It looks like we might have the answer right there.

SCSI Drives

More evidence of the Mac's resurgence at the show: There were some 14 vendors demonstrating SCSI drives for the Macintosh, including 30-megabyte drives going for as low as $900. However, there were some indications that not all the drives were FCC-approved.

The Ten Most Significant Macintosh Products and Developments

- *Microsoft Works*
- *dBASE Mac*, Ashton-Tate
- *Ragtime*, the desktop publishing spreadsheet by Orange Micro
- Dynamac, a laptop Macintosh
- *More*, the desktop presentation program by Living Videotext
- Various big-screen Macs, including the 8 1/2- by 11-inch Radius developed by Andy Hertzfeld and Burrell Smith
- The emergence of LaserWriter work groups featuring two to three linked Macs
- New desktop publishing programs featuring scientific, engineering, and financial applications
- SCSI drives flooding the Mac market just like the good old days in IBM PC land
- Few games were shown at the show. It's business as usual.

The general implication is that the Macintosh market is starting to resemble the PC market. Many companies are currently trying to unload hard disks and want to make a buck before the big players move in. We are seeing major PC companies like AST, Peachtree Technology, and other IBM firms beginning to take the Mac market seriously. They are getting their products out as fast as they can. As the saying goes, when it rains, it pours.

The Layered Look

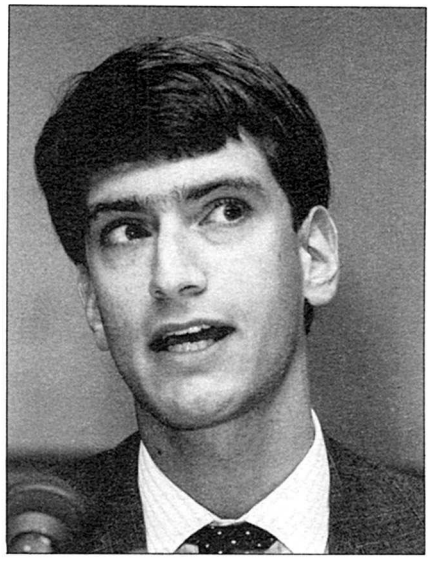
You want Macintosh success stories? Layered, Inc., whose *Insight* package, a top accounting program for the high-end Mac market, has shipped more than $500,000 worth of product since June 26–with a $400,000 backlog in orders. **Stephen Burakoff**, President of the Boston-based firm, credits his *Insight* sales kit with helping spur the demand. "Dealers buy methods and tools to sell product," he maintains. The smart-looking, expensively produced kit is replete with state-of-the-art flip charts, documentation, and user-friendly vibes.

An interesting insight into *Insight:* The founders of Interleaf have personally invested in Layered, Inc. **Dave Boucher** must know a good thing when he sees it.

The Chosen

Trend of the hour: Apple is placing its strategic marketing power behind key products and vendors such as Ashton-Tate's *dBASE Mac, Microsoft Works,* and even Layered's *Insight.* In fact, they are backing whatever products they feel are strong enough to help sell Macs. I don't know what the nature of the co-marketing schemes is, but I'm sure that it involves some co-op advertising arrangement as well as being involved in key press and marketing events.

If you are among Apple's "chosen," you become anointed and your future is sealed. At least for the time being–until the wind blows the other way. Ask Lotus.



'The challenge for Apple is that the Mac is getting complicated. . . But no one is doing better than Apple.'

Jonathan Rotenberg, President, Boston Computer Society

Year of the Database

At one such "chosen" event just prior to Macworld Expo, **John Sculley** made an appearance at Rickeys Hyatt in Palo Alto, California, to endorse Ashton-Tate's entry into the Mac market with *dBASE Mac.* Sculley had 18K words of praise for the new product. *dBASE Mac* and Ashton-Tate are "bringing together the gold standard of *dBASE* with the gold standard of human interface," he said. He also proclaimed that 1987 will be the "Year of the Database." What does he mean by that? Does that mean that Apple is working on a database for the Mac that will be as revolutionary as *MacPaint?*

The Flat Mac

Apple may have one running in their research labs, but a Golden, Colorado-based company named Dynamac has beaten them to the electroluminescent punch. Dynamac showed a flat Mac that will soon be available. It weighs about 15 lbs., is 3 1/4 x 13 1/4 x 15 1/2 inches, has a built-in 800K disk drive, and contains from 2 to 4 megabytes of memory. The screen aspect ratio is comparable to the Mac's. The machine also has a built-in modem, composite video output (22.5 KHz), a port for an 800K external drive, and a sleek black carrying case. Everything about this Mac is flat except the price. The basic Dynamac is expected to retail at $5000 to $7000.

Soft on Schools

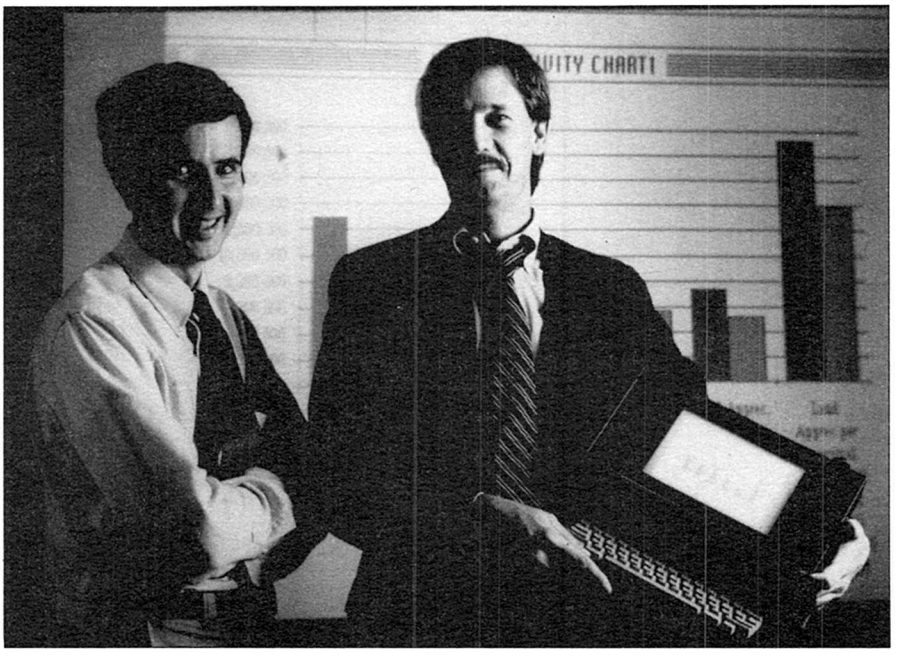
At the panel hosted by **Tony Bove** and **Cheryl Rhodes**, entitled, "The User's Guide to Desktop Publishing: Future Trends," a frustrated schoolteacher protested that schools should not have to pay for software updates, because students are likely to buy software in large volume once they leave the classroom. Schools have a limited budget, he pointed out.

Aldus President **Paul Brainerd** and Manhattan Graphics Vice-President **Marty Rosenberg** responded with an idea for a special plan for the educational market that would turn schools into beta test sites that would trade feedback for free software.

Esther Dyson echoed the economic realities of the educational market by suggesting, "If you can't afford the newest software, continue using the older versions." Esther was introduced as a "proofreader" for her newsletter, *Release 1.0,* and as the founder, at age 8, of the *Dyson Gazette,* which was produced "on a desktop using pins and carbon paper."

Show and Tell

The pressroom had telephones, but reporters couldn't call outside the Boston area unless they used Sprint or MCI codes. MCI is owned by IBM, while Sprint is owned by GTE and US Telecom. They couldn't get the operator to use AT&T, nor could they call their editors collect. Meanwhile, lines to the pay phones on the show floor were, on the average, about 12-people deep on each phone. Reporters from out of town had considerable trouble filing their stories.



Stephen Hull (left) and Bill Goins originally developed the Dynamac laptop Macintosh for themselves and then decided to put it on the market for others to use.

Fortune 500 Front

Control Data Corp. of Minneapolis reportedly signed an $8 million deal with Apple. Also, Letraset, a subsidiary of the Fortune 500 company Esselte, the multi-million-dollar Swedish colossus that owns International Typeface Corp. (they have licensed fonts to Adobe and Apple), has purchased *MacPublisher* from Boston Software (and renamed it *LetraPage*). Yet another instance of a large corporation taking the desktop publishing phenomenon seriously.

Rumor No. 28

Ashton-Tate is said to be developing a spreadsheet program, codenamed *Glass,* that will supposedly give *Excel* a run for it.

PageMaker Revised

PageMaker, the leading desktop publishing program, is gearing up for the fall release of its IBM PC version. In fact, the company has increased its staff to more than 80 employees and has expanded its Seattle offices. According to Aldus' **Paul Brainerd**, 80 percent of *PageMaker*'s code is machine independent–as new features are added, they will be included in both versions.

PageMaker is really driving Macintosh sales. In fact, some recent market research by Aldus found that in excess of 35 percent of the newly registered owners of *PageMaker* bought Macs because they wanted to use *PageMaker.* And about 50 percent purchased LaserWriters on the strength of *PageMaker*'s capabilities. The PC version should sell even more LaserWriters.

The Works Shop

One of the main events at the Macworld Expo was the unveiling of *Works,* Microsoft's integrated package for the Mac. Microsoft Chairman **Bill Gates** gave a demo himself, and it was impressive. Once again, Gates showed that he really knows his product, as he zipped through it in a completely unpretentious manner. "It's the greatest all-in-one software product," Gates claimed. It takes up where *AppleWorks* left off, and, of course, *AppleWorks* was the most successful product on the Apple II.

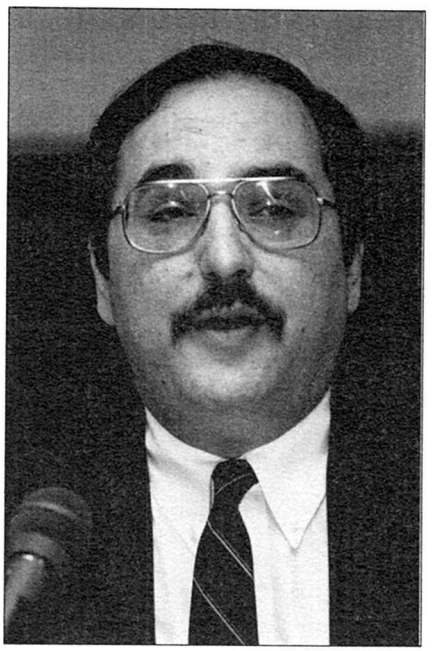
Gates differentiated *Works'* product market between two types of end users: the "depth users," who like products such as *Excel,* and the "breadth users," who are more likely to appreciate *Works* because it offers a balanced set of comparable applications that work together well.

According to Gates, the depth user has a primary task, which is focused on using as much functionality as the program can provide. The breadth user, on the other hand, performs multiple, general tasks but won't make the commitment to learn a more in-depth product.

Works has barely come out, and already eight books on the subject are soon to be published, not to mention templates, spelling checkers, and macros.

Up Sculley's Alley

Needless to say, **John Sculley** was right on hand at the *Works* intro. He gave his exuberant blessing to the whole affair: "Now the Macintosh is showing more strength in business," he said. "We are developing the home office market for the Mac." *Works* and the Mac with the new 128K ROM are the products for the home office, he maintained.



'Now with the 20-megabyte hard disk, there is no comparison with the Compaq 286 machine. And there is no IBM equivalent to Switcher.'

Dave Winer, President, Living Videotext

"Timing is everything," Sculley continued. "We are just getting ready for university sales, and *Works* will find a good opportunity there."

Why would John Sculley want to use *Microsoft Works* and not Lotus' *Jazz?* Sculley was asked. As a user, he said he prefers *Works* because "the position of *Works* has been thought out more carefully than [that of] *Jazz,* and it is easier to use. Also, the program is better timed, and Microsoft's strong market position will contribute to *Works'* success."

In other words, John Sculley believes that Microsoft is a lot smarter than Lotus.

The Adobe Offer

Adobe Systems has a public stock offering on the way. Its prospectus indicates that about 80 percent or more of its revenue comes from Apple. Investor's question of the day: Would you invest in a company that has basically one source of income?

10,000 Libraries

Jean-Louis Gassée, Vice-President of Product Development for Apple Computer, gave an address entitled "10,000 Libraries of Alexandria." It was an eloquent technological yet humanistic dissertation on the potential of the Macintosh to alter human knowledge. Perhaps his most prophetic observation was, "The mainframe is not the sole repository of knowledge."

With this idea, he summed up the current philosophy about micro-to-mainframe links. There will be more information directly accessible to people over local area networks, not over mainframe links. He disagrees with the dictum "Thou shalt connect to the Great Mainframe or be banished to outer darkness."

Gassée also spoke about the user-unfriendliness of current electronic mail services, describing the general mail service as "KGB mail." He also remarked, "The ether is as controlled by the government as phone lines." In a related conversation in the pressroom afterward, someone remarked that he had never sent any sensitive information about future Apple products in letters to colleagues over MCI Mail since "MCI is mostly owned by IBM, and don't you think they're reading such mail?"

"Simulation is the name of the game in personal computing," Gassée said. "The key direction is to create another phase of personal computer, a new phase to marry the system software with communications software, a set of tools that allows access to remote historical information." It would therefore become easier to access information from the electronic "libraries of Alexandria."

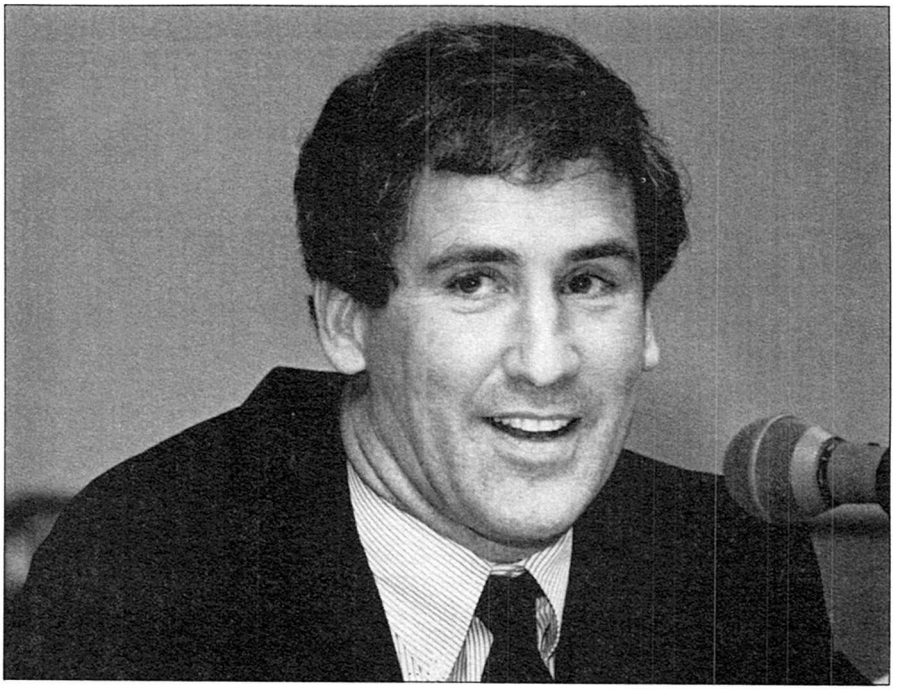
All the information is already there, he noted, but there is no way to get at it in a reasonable manner and for people to be enriched by it.

Speaking of those fabled libraries of Alexandria, Gassée was asked an excellent question: Did he know what eventually happened to those libraries? They were all burned down–destroyed. Gassée admitted that he hadn't dwelled on that point.

When he was asked about the impact of computers on the Third World, Gassée referred to a trip he had made to Iran since the fall of the Shah: "The values of civilization are more important than personal computing," he said. "Learning and education are more important than PCs. There will be no Mercedes when you can't afford a bicycle. Computers are a luxury when you need books and chalkboards."

Born-Again Heroes

What a difference a year makes. On the same keynote panel at the Macworld Expo in Boston last year, **Bill Campbell** got 99 percent of the questions–and they were all negative. People beat up on him. They were mad at Apple. Why weren't they doing this and that? they wanted to know. Why hadn't they come out with a more powerful machine?



'Horizontal productivity' is what will be happening next, according to Bill Campbell, Executive Vice-President of Marketing and Sales at Apple.

This year, it was as if all the panelists were born-again heros and could do no wrong. The only voice crying in the wilderness was that of **Jonathan Rotenberg**, President of the Boston Computer Society. In the midst of all the Mac euphoria, he made a rather interesting observation that somewhat punctured the prevailing mood of optimism.

"The Mac is finally embraced as a second industry standard," Rotenberg acknowledged. "Now the challenge for Apple is that the Mac is getting complicated. The original vision was to have it be like other desk accessories. Because of all the features now offered, it is practically guaranteed that you will get a system bomb sometime. But even so," he had to admit, "no one is doing it better than Apple."

The Mac Clone

Will Zachmann of IDG talked about the rumor that IBM is going to come out with a new PC that has a really good graphics interface and a bitmap screen and that won't run MS-DOS software. This machine will be a Macintosh clone, more or less, only it will have its own proprietary operating system. However, Zachmann observed that the "Blue Mac" wouldn't hurt Apple. Rather, it would actually certify and endorse the Mac's approach to computing and help make the Mac stronger than ever.

"If Sculley is smart, he will develop a fabulous ad campaign comparing this new IBM machine to the Mac," Zachmann suggested. " 'If you want to buy the real thing, buy a Mac.' "

Other Voices

Dave Winer noted that *ThinkTank* for the PC is moving well, but that he personally prefers the Mac over the PC. He believes the software that Apple now offers is of much higher quality and is more powerful than IBM's. "Now with the 20-megabyte hard disk, there's no comparison with the Compaq 286 machine. And there is no IBM equivalent to *Switcher*," he observed. As a self-proclaimed power user, Winer says that he recently and decisively switched from the Compaq 286 to the Mac Plus.

Meanwhile, **Roy Folk**, Vice-President of Marketing and Strategics at Ashton-Tate, admitted that his company has been late to embrace the Mac but now does so "whole-heartedly." The Mac opens personal computing up to a broader base, he believes, bringing more people in. "Apple has a chance to establish itself as a solid, viable, signficiant alternative to IBM," Folk said.

Bill Campbell maintained that under Jean-Louis Gassée, product development at Apple is under control. He does wonder if Apple will get too niched in desktop publishing. However, he believes that the introduction of programs like *dBASE, More, Microsoft Works,* and others will offset that possibility. "Horizontal productivity" is what will be happening next, according to Campbell. Apple's immediate goal is to "eliminate data communications lockout" and become more market-driven in this area.

'Apple has a chance to establish itself as a solid, viable, significant alternative to IBM.'

Roy Folk, Vice-President of Marketing and Strategics, Ashton-Tate

"The Macintosh office system is not here yet, but it will be," **Bill Gates** predicted. Then he noted that with its simple graphics user interface, the Mac is capable of being a better spreadsheet or database machine than the IBM PC when good software is developed for it. Looking back at the past year, Gates observed, "The issue was never 'Do users love the Mac?' but how to get more users to buy it? During the last six months, there have been strong software sales once again." Gates acknowledged that Microsoft will be investing even more in the Macintosh in the future.

CD-CDI Connection

Will Zachmann was asked about the standard for CD-ROM and CDI. When Sony and Philips came up with the CDI standard at the Microsoft CD-ROM conference earlier this year, it was a blatant power grab, Zachmann noted. In some ways, CDI is a confusing standard, he observed, but it assures those companies that they will be in a good position to sell their own products into that market.

The CD-ROM standard is certainly good enough, Zachmann believes. "It's the elbow up on the curb," he said. He suspects that within 18 months a product from Apple will make use of the CD-ROM standard–and if IBM wants to play, they should stick to that standard as well. "IBM will probably do something in this line," Zachmann speculated, "but they will muck up and fail if they introduce their own standard."

Borland on Target

Borland and Target Software, the Miami developer of the spelling and grammar checker *MacLightning,* are embroiled in a dispute over the rights to use the word *Lightning.* Target managed to put out *MacLightning* before Borland could claim the name. Borland has a spelling checker they would love to attach that moniker to. This is another case of a little company that inched out a giant. Maybe Borland should put out a name checker next time.

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An annual subscription to Subroutines *is $195 (outside the U.S. add $25 for postage). Send communications to our new address, 501 Second St., Suite 600, San Francisco, CA 94107, 415/546-7722.*

SUBROUTINES
David Bunnell's Newsletter From Inside the Personal Computer Industry

VOLUME 5
NUMBER 9
OCTOBER 1986

LASERLETTER

Jobs Sparks Desktop Debate

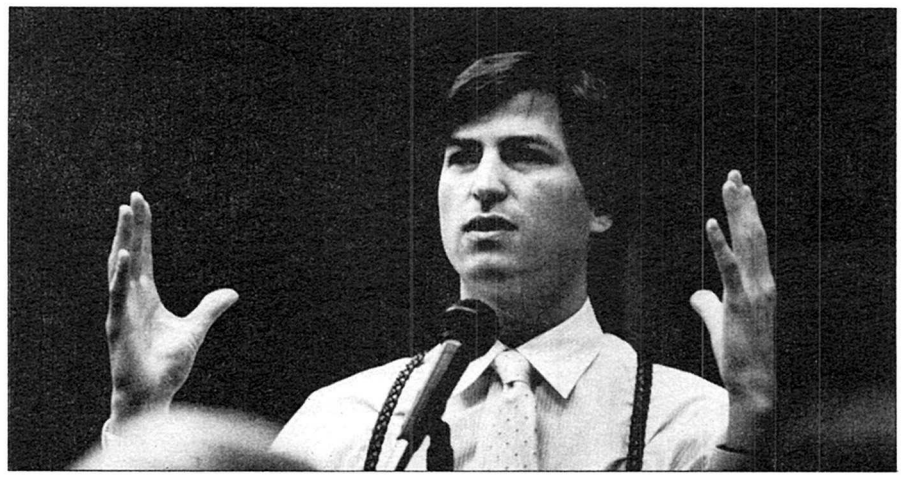
Survey on Desktop Publishing Conference

A lot of thoughts have gone into second-guessing **Steve Jobs'** comments at the recent Seybold Desktop Publishing Conference in San Francisco. As the keynote speaker, he first titillated and then outraged his audience by calling Hewlett-Packard "brain-damaged" for adopting DDL as its page description language. Then he asserted that the Seybold conference, with 1000 people attending at $600 a head, was a $600,000 event to talk about a market that won't be around in two years.

"Today's unique functionality will become built in and inexpensive in about two years," Jobs stated. He later appeared to extend the grace period on the demise of desktop publishing as an industry to five years.

After his keynote address, Jobs chatted for a while and then disappeared from the conference, although his address was the main topic of conversation for the four subsequent days of the show.

Where is desktop publishing headed? Will the features offered in page makeup programs become built-in functions of word processing? Is desktop publishing an extension or evolution of word processing? Is it an industry or an application? Is it a technology or a product? Are there lessons to be learned from historical introductions of so-called "revolutionary" applications that in time became ordinary "user-friendly" functions?



'Today's unique functionality will become built in and inexpensive in about two years.'

Steve Jobs, President, Next Inc.

Subroutines called more than 50 leaders in the desktop publishing industry to ask them what they thought, first about Jobs' remarks, and second, about how they viewed the desktop publishing industry in general and where they think it is headed.

The Image Market

"I certainly think that a lot of the features are going to be built in," said **John Henderson**, President of Tall Tree Systems. "If the market isn't going to be there, why build those facilities into the products?

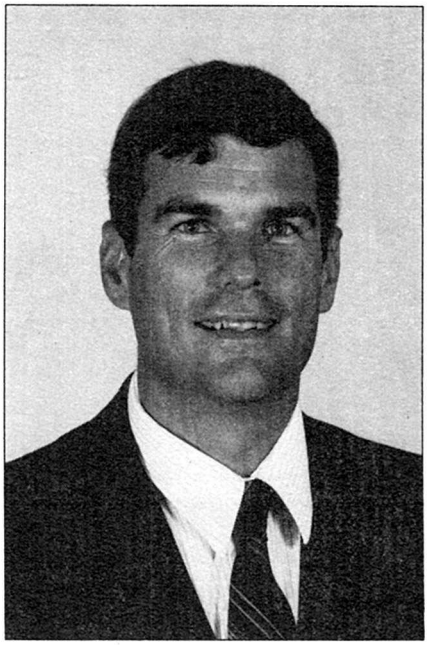
"Graphics and desktop publishing go hand in hand. I look upon it more as the 'image market.' You are storing and retrieving images, which might be text, scanned images, line art, graphs, or video signals. Computers are going in the direction more and more of processing images than just basically processing characters."

Another area that Henderson sees desktop publishing encompassing is the market for line printers. "What we've discovered is that laser printers can really produce better paper than the offset press," he opined.

"Practically every computer application can use a text editor, and every application will probably utilize a desktop publishing element. Maybe in that sense, Jobs was right–that market is going to disappear in two years. But I don't think it's going to go away. It's going to be absorbed into a bigger market. You're going to see the idea of publishing images and graphics as the dominant one in the coming age."

WYSIWYG Valhalla

Whether desktop publishing will be tomorrow's word processor is debatable, according to **Don Heiskell**, Vice-President of Engineering at Ventura Software. "People are not going to quit wanting high-quality output or to have more control over their documents. That's not going to go away in two years. The features that are in desktop publishing today will be options in tomorrow's word processors. The WYSIWYG look of the page, access to a large variety of fonts, and style sheets–all the kinds of things that make up the new aspects of desktop publishing today–will be built in.



'Jobs still doesn't understand how corporate America thinks and acts.'

Charlie Jackson, President, Silicon Beach Software

"The 'inexpensive' part [of Jobs' statement] I don't agree with. Sure you'll find, as with paint programs, that there are $49.95 packages. But word processing packages have illustrated that it is stratified into areas. The high-end packages–the WordPerfects of the world and the IBM Displaywrites–really haven't changed their prices much, not in recent times. The software, as a matter of fact, is a small part of the overall pie of desktop publishing. The hardware is still by far the more expensive part."

Features Overkill

"I disagree strongly [with Jobs' statement]," reported **Charlie Jackson**, President of Silicon Beach Software. "This is another example of someone who is a big name spouting off. I'm not a Steve Jobs follower. He almost brought Apple down, and my company is totally tied to Apple. Certainly he was a tremendous force and a great thinker, but as a businessperson, his views don't mean much to me. I think he's dead wrong in this case.

"It took **Bill Atkinson** three years to do *MacPaint*. It was severely limited by the hardware. Along came the 512K Mac. It has taken us over a year and a half to produce the next-generation paint program, and it is far from the ultimate paint program. In fact, we will have to work on it for another year just to get it where we want it. And that doesn't take into account evolving it to take advantage of color, gray scales, or whatever Apple does with next year's open Mac.

"The point is that the end-all system isn't going to be produced two years from now. If Jobs thinks so, he's out to lunch again. Remember, this is the guy who really believed he could sell the 128K Macintosh to the Fortune 500 with no hard disk and no letter quality printing. He may be a visionary, and there is no doubt that he is one hell of a charismatic leader, but I believe that he still doesn't understand how corporate America thinks and acts."

Dominate, Not Die

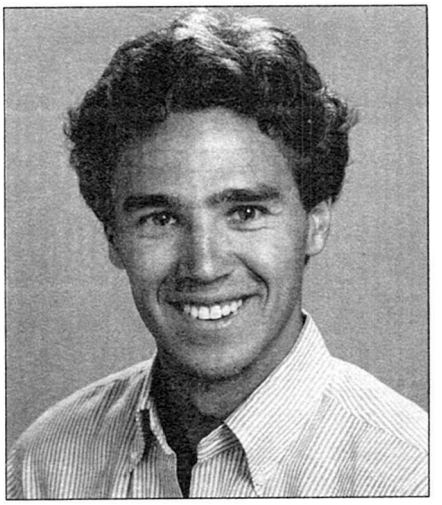
"Steve Jobs mentioned that desktop publishing capabilities will become standard and included in most systems. His system potentially may have that, but I don't think all systems will," said **Robert Simon**, President of PS Publishing.

"In terms of the desktop publishing industry and publishing in general, you can think of it as an extension of the word processing industry and as an evolution. [Jobs'] comment was that this industry is going to die and [the features are] going to be incorporated into word processing. Alternatively, you can claim that word processing has gone as far as it can go and is in turn going to die and merge into electronic publishing.

"The analogy is the caterpillar. Word processing today is crude and somewhat limited, and at some point it's going to metamorphose into a butterfly. That will be the colorful, sophisticated desktop publishing applications. Instead of viewing desktop publishing as dying out, I think the appropriate view is that it's going to dominate."

Manhattan Transfer

"We disagree with [Steve Jobs' statement], said **Michael Tchong**, Vice-President of Marketing at Manhattan Graphics. "We think it's going to go in exactly the opposite direction. Jobs says that desktop publishing will be an add-on to everybody else's product. We think that spreadsheets and databases will be add-ons to desktop publishing programs. As a matter of fact, we have already integrated word processing into *Ready Set Go*. In our next super product, you will see spreadsheets built into a desktop publishing program, probably sometime in 1987.



'Instead of viewing desktop publishing as dying out, the appropriate view is that it's going to dominate.'

Robert Simon, President, PS Publishing

"It's kind of unnecessary to have stand-alone spreadsheet products, because a lot of people do their calculations on the run, while they are creating documents. That's going to cover 90 percent of the usage of that application. Apparently, Steve does not think that."

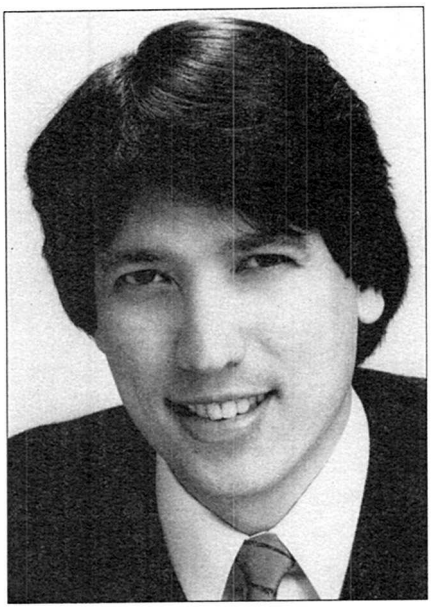
Ten Speed Templates

Publish! Editor **Susan Gubernat** says that "For people who aren't graphic designers and who have no interest in becoming designers, there will be templates and style sheets. The business market will probably be further helped by such structures the way templates for Lotus *1-2-3* made the power of that spreadsheet available to casual users. Just as everyone isn't a *1-2-3* power user, not everyone is a *PageMaker* aficionado or a designer, but they will probably be able to benefit from customized style sheets."

Desktop Island

"What is the real difference between word processing and desktop publishing?" asks **Daniel Remer**, President of Island Graphics. "Nobody has been able to answer that to my satisfaction. I don't think it's a difference in kind; it's a difference in quality. I don't know if it will be in two years, three years, or four years, but sometime during that time frame, I don't see why anybody would want to use a word processor.

"I see one as an outgrowth of the other. Either they will be using a word processor that will do everything that desktop publishing can do now, or they will be using desktop publishing [software] and they won't be using word processors–they will become the same thing."



'We think that spreadsheets and databases will be add-ons to desktop publishing programs.'

Michael Tchong, Vice-President, Manhattan Graphics

On the Level

"We tend to see the desktop market consisting of several different market levels," reports **John Monson**, Product Manager for Software Publishing Corp. "One of them is perhaps the biggest in numbers: people who want typographic-quality output, simple page formatting. My sense is that this part of the market will be consumed by word processing programs. Jobs is right as far as that goes, but I think it will take a lot longer.

"However, in terms of true professional-type publishing activities, [such as in] the *Harvard Professional Publisher*, that's not the case. Because there you are dealing with a range of capabilities beyond what is going to be included in the word processing [package].

"A large part of the desktop publishing market will be overtaken by word processors. All the major word processors are adding more page composition and typographic features. However, there will still be a substantial market for more complex documents that will require dedicated composition software, such as for brochures, manuals, and magazines."

Going Horizontal

"I think [Jobs] is right, said **Robert Auster**, Director of Market Development at Gradco Systems. "You know, I used to work at Adobe and had a lot of meetings with Steve when [desktop publishing] first started. In general, I share his opinion a great deal. But you have to qualify what that means. What it means is that the application for professionals to do 'publishing' is a very limited marketplace.

"Publishing as we know it will become a de facto kind of thing. Everything you will do will have 'publishing' in it: type fonts, graphics, and quality output.

"We used to say, 'We're going to build a typographer into the software so the secretary and the business manager don't have to sit there with 150 fonts staring them in the face.' They don't know about kerning or leading, or how typefaces play together, they just do their jobs. Desktop publishing, for 90 percent of PC users, is an intimidating concept, but it's a latent need. That means that the Microsofts and the Ashton-Tates–the leaders with high visibility in whom the market has a lot of confidence–will integrate the typographer [the functions and choices of typography] into their products, and it will go completely horizontal."

'I don't know if it will be two years, three years, or four years, but sometime during that time frame, I don't know why anyone would want to use a word processor.'

Daniel Remer, President, Island Graphics

The High End

"Some high-end word processors, such as *WordStar 2000* release 2.0, already offer entry-level desktop publishing features," reported **Leon Williams**, President and CEO at MicroPro. "That includes multi-column formatting and strong laser printer support (choice of fonts, on-screen highlighting of print features, dynamic rulers, etc.). In the future, word processors will include more desktop publishing capabilities. At some point, there may be a crossover product that is equally at home as a word processor and a desktop publishing system, but that will not happen immediately.

"Most of the initial growth in the desktop publishing segment will come from users who also have word processing requirements. They will require a product that emulates the interface logic that they are used to and comfortable with, as well as a file structure that is compatible with the library of text files that currently exists."

Features Shock

According to **Jim Rafferty**, Vice-President in charge of Development at Cricket Software, "Desktop publishing may not exist [in the future] the way we mean it today. [But] two years is a little optimistic. The industry moves fast, but I don't think it moves that fast. The more complicated the user interface and the more complicated the software, the slower this industry is going to move.

"Desktop publishing isn't simply word processing. It's an expansive area of different fields. And you can only cram so much into a product before you actually muddy up the usefulness of any given feature. If you go too far and cross the threshold, the product becomes difficult to use and work with. I don't think people want that."

Not an Industry

"I agree with Steve but I'd put it differently," said **Ajit Kapoor**, Director of Electronic Publishing Market Analysis at Dataquest. You cannot build an industrial application [out of desktop publishing]. That's what my sense is. The way I see it, it is still one industry called 'computer-based image assembly,' or what some people refer to as computer graphics. I'm trying to give it a better name.

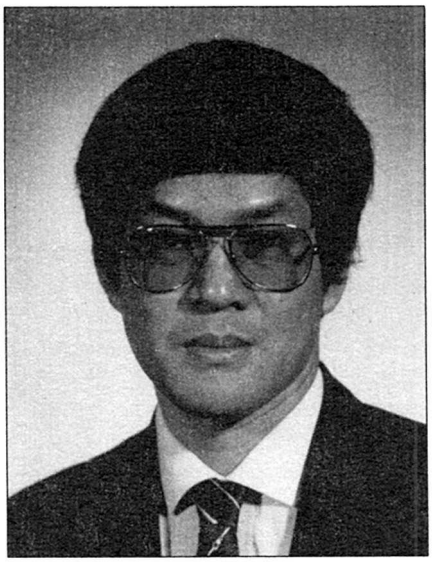
"Now the latest applications are streaming from it as the maturity of the end users evolves. That's what you are seeing. Nothing in desktop publishing is new per se or didn't exist a few years ago. The question is: If people understand it now, are they going to buy it? For example, word processing was always touted as an industry. I remember my days at Xerox when I always said that [word processing] is not an industry but an application. I hate to say I told you so, but look what's happened to it.

"Even IBM claims now that the PC is not an industry–it's an application. In that sense, I agree. I don't agree if Steve Jobs was implying that this is just a fad that will die. I think it's going to stay with us. It's already changed and it's going to continuously change the way in which documents are created, produced, and read in the business market. In the next few years, I think that not only PC-based publishing, but desktop publishing, or whatever you want to call it, is going to flourish and penetrate deeper into our business and even some of our commercial environments.

"This is a very inexpensive test, and as people in business and industry and the Fortune 1000 companies see the value that it brings, you're going to see the MIS department putting more pressure on the print shop managers. The print shop managers will also realize that 'Hey, it's not a fad, it's real.' This will have a very positive effect in general on the information processing industry."

Desktop Friendly

From **Shih-Chi Lee**, Vice-President of Marketing at Microtek Lab: "When we start to see people who only occasionally used to do publishing getting in on it, we can really claim success. From that point on, I do feel that integration is going to be the way to go. Right now people talk about integrated systems–word processing, spreadsheet, database, graphics, communications. I think desktop publishing can be integrated in the same way."



'When we start to see people who only occasionally used to do publishing getting in on it, we can really claim success.'

Shih-Chi Lee, Vice-President of Marketing, Microtek Lab

Beyond the Pale

Paul Saffo, a research fellow at the Institute for the Future, says, "Desktop publishing is a fad. But there are two kinds of fads: those that come and go, and those, like 'user-friendly' and desktop publishing, that come and so change our expectations that they seem to disappear but in fact fundamentally change the way we do things. 'User-friendly' changed our whole perspective about what we expected to see on the screen. Desktop publishing will change our perspective about what we expect from a printer.

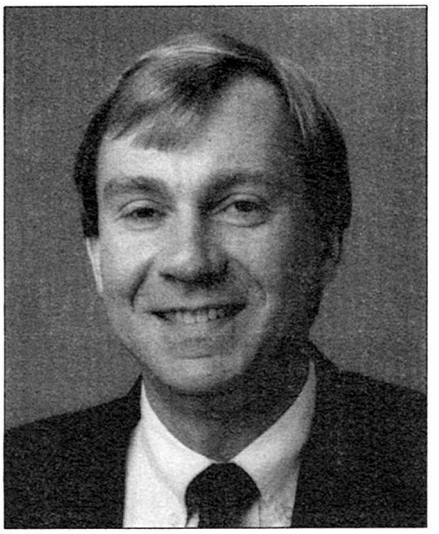
"Jobs was right when he said that desktop publishing would not exist two years from now (he has a knack for overstating the obvious). The desktop publishing market is atomizing into lots of more specialized markets, but the concept will be with us for a long time to come."

Half Right

"Jobs is half right," clarified **Lavon Collins**, Marketing Communications Specialist at the Boise Division of Hewlett-Packard. "Some of the functionality that people feel is desktop publishing is already starting to exhibit itself in word processing systems. *Microsoft Word*, with its ability to change fonts easily, do multiple-column output, and style sheets where you take a page and compose it, indicates that at least part of it is already happening.

"The lower end will be incorporated into word processing applications, and the more sophisticated portion will continue to play a role in electronic publishing.

"There is not enough operating space in MS-DOS to incorporate spreadsheets, business graphics, and page composition in a single package. So what you need to do as you get that very sophisticated high end is to have separate packages running and to create elements that the page composition will come in and paste up.



'Desktop publishing is a technology–not a product. We look at it almost as a vertical application. It's done primarily to reduce the cost of typesetting.'

Paul Stannard, President, Megahaus

"There are some architectural limitations that will prevent Steve from being 100 percent right. By the time I put all that functionality into a single application, I can't load it all into an MS-DOS environment."

Desktop Bandwagon

"My reaction [to Steve Jobs' statements at the conference] is he's got it about 60 to 70 percent right but his timing is premature," said **William McKissock**, Manager of Publishing Systems Marketing at Xerox. "The real marketplace will settle into those that have a requirement to be serious publishers, [those for whom] doing document design and layout and the formal publishing process is a good-size portion of their workload–not a casual portion–unlike the guy who does word processing and wants to make the headlines fancy.

"People who buy the professional packages will continue to buy them. The systems that support them will have some special requirements for hardware and software. I do believe that a lot more of the stuff will be built into the hardware that has been in software in the past. The process will probably take longer than a couple of years–more like five–and even that might be premature.

"The word processing people have not yet been as aggressive as I would have guessed in jumping on the [desktop publishing] bandwagon, nor have the people like Lotus, who I thought might see that there was a real opportunity to hype their existing base packages. Knowing how long it takes to get the market to go, I don't think it will jump up as quickly as Steve Jobs has implied."

Already Here

"Of all the speakers [at the conference], **Steve Jobs** and **John Meyer** [President of Ventura Software] were right on the button," reported Megahaus President **Paul Stannard**. "His message was that desktop publishing is a technology–not a product. What that means is that right now, in 1986, we look at desktop publishing almost as a vertical application. It's done primarily to reduce the cost of typesetting.

"Essentially you can apply high-quality, realistic looking printed output to any computer program. The reason [what Jobs said] appealed to me is that we came into this business through high-quality output from a database, and we've had a product for two years, called *Megaform,* which allows you to merge information from databases and other original [character-based] sources into realistic business forms and print it out on a laser printer. You can prepare an IRS 1040 [form], and it looks like it was printed on blank paper by the Labor printer. There are actually a couple of these packages that have been around for quite awhile. The success of the document preparation task has focused people's attention on things that have actually been going on in the background all along.

"I don't think it's going to happen in a few years. I think it's going to happen now."

Next to Next

"[What] we at Apple believe is not too dissimilar from Jobs' [view]," said **John Scull**, Desktop Publishing Marketing Manager at Apple Computer. "The functionality–the ability to have high impact in communications, using graphics, typography, fonts, and the ability to have layout capability so you can modify your presentation to accentuate the point you want to make–that right now is what we call desktop publishing. While people are most familiar with page composition programs such as *PageMaker, Ready Set Go,* and *Letra-Page,* what we are seeing is those capabilities in general productivity applications.

"We're already seeing that capability within the spreadsheets, such as *Excel,* with its tremendous graphics, and the flexibility that exists for presentations within database managers, be it *FileMaker Plus* or the newly announced *dBASE Mac.*

All [these programs] have typographic capability and tremendous layout capabilities, as far as presenting the reports, or 'database publishing', as some people are calling it, all the way to the recent introduction of new word processors such as *Haba Word* and T/Maker's *WriteNow.* They take off from where the word processor on the Mac already had the ability to mix text and graphics to the next step–to introduce some basic layout capability, multiple columns on screen, show-page capability. We believe we're seeing that functionality today. That's why the Mac is doing so well."

Schtick 'Em Up

"My gut reaction was that Steve [Jobs] was doing another schtick," **Stewart Alsop II**, Publisher of *P.C. Letter*, recalled. "Then I started thinking about it. What he described is a real dream for how computers could be in the future.

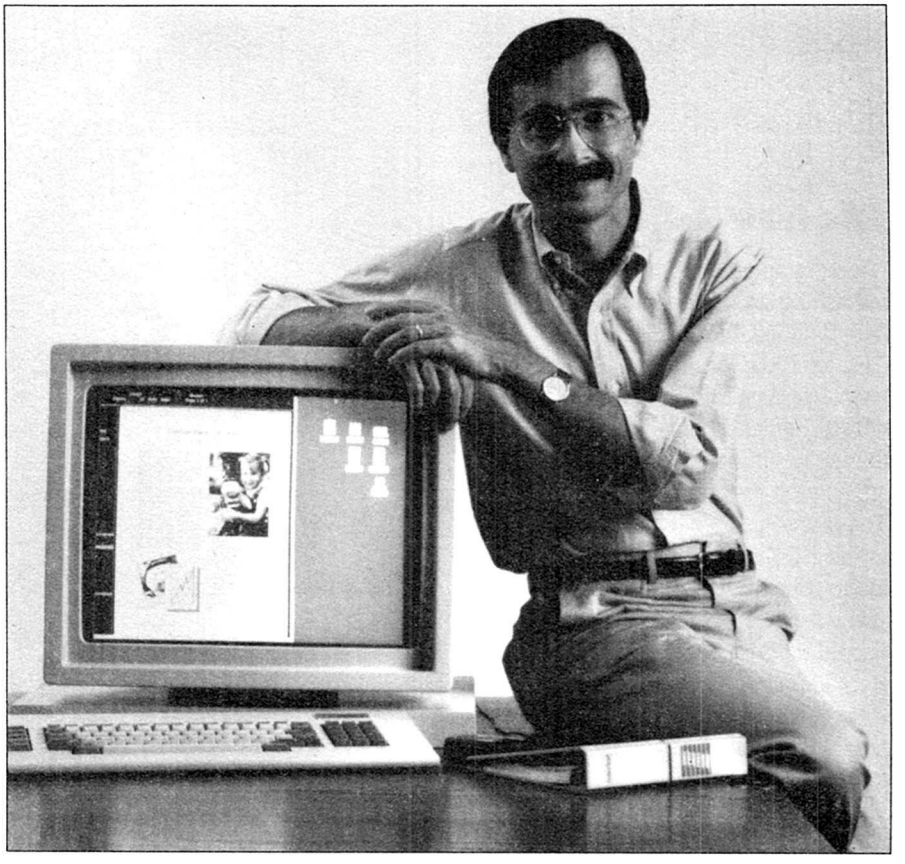
"Imagine a world that has indeed converged on 400 dots per inch, where [monochrome] displays have a resolution of 400 dots per inch, facsimile devices communicate either directly from a computer or a piece of paper at 400 dots per inch, and laser printers print using the same drivers as the screen–at 400 dots per inch. In a world like that, the computer would become a different kind of device. It would become a medium for communication–formatted, designed communication, not just text, but the whole method. And computers would serve an entirely different purpose or another purpose in addition to what they already do.

"The world would be quite different. That's what the real message behind Jobs' [address] was.

"But I don't think that's going to happen. It's a nice dream, but dreams rarely come true in this business, because it depends on far too much cooperation between hardware companies. If you think of that world, where, say, you have a single language for describing screens and output, you understand why [Jobs] said Hewlett-Packard was brain-damaged for going with another language [DDL]."

Bundling Perspective

"I think [**Steve Jobs**] is pointing to something that is important as a trend," said Interleaf President **Dave Boucher**. The kind of functionality that is currently being demonstrated by a lot of desktop publishing products is relatively simple. It's very mainstream in terms of being useful to the majority of personal computer users, and therefore it will tend to become more like a commodity product.



'There will continue to be a number of very distinct markets for computer-aided publishing which require a functionality that is much more specialized than what is going to be found in commodity-level products.'

David Boucher, President, Interleaf

"It seems to me he's assuming that people are going to pay for the hardware and not pay for the software. That represents some prejudice based on his experience at Apple, because Apple sold hardware and didn't sell software.

"A different way of looking at it is, maybe they will buy desktop publishing packages and get PCs for free. I think it's a matter of perspective.

"Another observation that runs a little counter to what he said is that publishing is a very deep and rich market. The level of capability and the kind of functionality required varies tremendously depending on the application. While I do believe that some substantial level of functionality will be widely available on PCs and perhaps bundled with hardware, that may not necessarily be the case. It's also true that the standard package will not have all the functionality necessary for every market.

"There will continue to be, as far as I can see, a number of very distinct markets for computer-aided publishing which require a functionality that is much more specialized than what is going to be found in commodity-level products."

The New 1-2-3

"Rumors about the death of desktop publishing are exaggerated," opines **David Goodstein**, President and CEO of InterConsult Inc. "There's a more important thing that Jobs missed, which is that desktop publishing is the ultimate kind of end user application program. It's a solution. The last solution we had like that was Lotus *1-2-3*, which harnessed the machine to do real work for real people. If you remember the glory days of *1-2-3*, people used to walk into the retail store and say, 'Give me Lotus and anything it runs on.' They are doing that now with Aldus [*PageMaker*]."

Out of the Bitstream

"In essence, word processing is the same thing as desktop publishing, except the look of the product is inadequate," said Bitstream President **Mike Parker.**

"Desktop publishing is word processing, with the output, the pages, brought up to a reasonable level. The only key difference is that on one the output is adequate. Now why should a product, word processing, remain in existence because its distinction from another product is that it isn't as good? Desktop publishing is the completion of word processing. It is an absolutely inexorable move. And the most exciting thing at the [Seybold] conference was the accurate identification of that. The time frame is not important. The important thing is the direction."

'Dreams rarely come true in this business, because it depends on far too much cooperation between hardware companies.'

Stewart Alsop II, Publisher, P.C. Letter

One Last Word

I think desktop publishing is actually a limited concept with a brief life span before it becomes passé. Why? Because all publishing is ultimately going to be done on PCs. Desktop publishing is not just a subset of publishing. It will become publishing.

That's one of the reasons we decided to call our new magazine *Publish!* We felt that *Publish!* magazine will come to represent the standard way in which people publish material. It won't be just the avant-garde, high-tech organizations that are "with it" or that have the right equipment and motivation to be early adopters of PC publishing technology. Everyone will be using it. *Publish!* will become a publication for people who publish ideas, books, magazines, and brochures, including marketing communications and documentation.

The real quantum leap–and the most significant revolution that will be brought about by PCs and PC publishing–is not simply the ability to create cheap typesetting. Reducing typesetting costs is certainly an important development, but it can hardly be called revolutionary. What will be truly revolutionary is when we completely alter the economics of the publishing business by distributing materials directly from the publisher's personal computer to the reader's personal computer.

Remember, more than 50 percent of the cost of publishing is simply paper and ink. Just think what will happen when that cost is eliminated.

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SUBROUTINES
David Bunnell's Newsletter From Inside the Personal Computer Industry

VOLUME 5
NUMBER 10
NOVEMBER 1986

LASERLETTER

Hackers 2.0

PC Visionaries and Industry Legends Debate Micro Future at 1986 Conference

For some of the 194 attendees (180 men and 14 women) at the recent Hackers 2.0 Conference held in the wooded hills of Saratoga just outside Cupertino at Camp Swig, a Jewish summer camp, it was midlife hack. Fewer anorexic-looking anarchists were in evidence than at the last conference, in 1984, and far more potbellied, T-shirted micro-maniacs are pushing 30 and beyond.

But even amid the red hues of autumn leaves, the dominant color was that of highly dense gray matter, a kind of smoldering intelligence that manifested itself in little group sessions gathered outdoors under the trees, on the lawns, and in the sunlight.

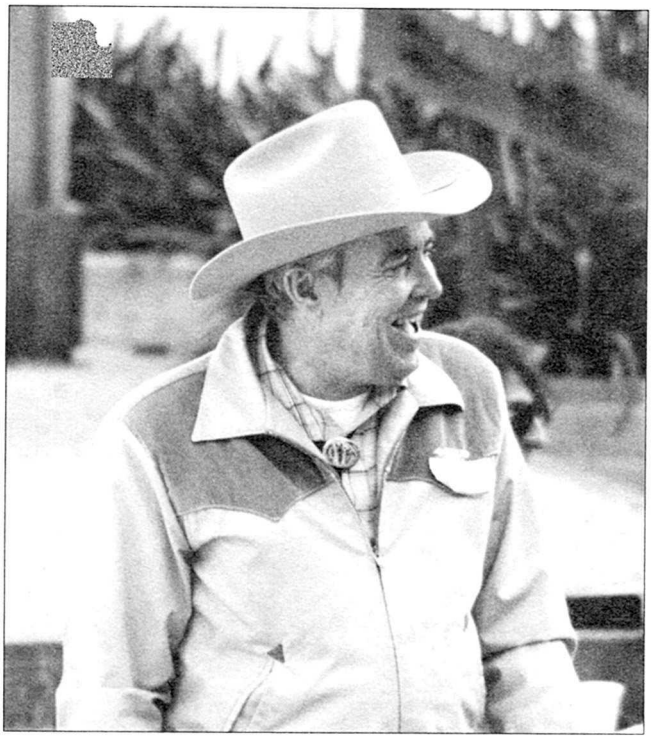
Indoors, cabins with bunk beds housed inanimate forms resting from all-night hacks and talks, while the equipment room buzzed with 8-10 Macs, including one Prodigy 4, by Levco; Apple IIGSs; Atari STs; Amigas; Sun workstations; and super-powered IBM PC and AT clones. Laptops and other computers were spotted throughout the camp, and adjacent to the equipment room ran nonstop computer-generated graphics videos.

The Hack Pack

There was no telling whom you might run into at the snack and drink area: from mythical bad boys like **John** (Cap'n Crunch) **Draper** to archetypal visionaries like **Ted** (Project Xanadu) **Nelson** and **Lee** (Community Memory Project) **Felsenstein,** as well as hacker emissaries from Pacific ("If you can't fight 'em, hack with 'em") Bell, and even some incognito hackers from IBM who temporarily buried their blue suits.

There were industry leading-edgers, like **Chris Espinosa,** Manager of Developer Support at Apple, who was discovered at the young age of 14 by **Steve Wozniak**; **Doug Carlston,** President of Broderbund Software; **Robert M. Carr**, Chief Scientist at Ashton-Tate and the designer of *Framework*; **Jef Raskin**, who started up the original Macintosh team and now has a product that is, in his words, "as much an advance over current technology as the Macintosh was in its day"; and **David Thornburg**, developer of the Koala Pad.

The event attracted mild-mannered hackers such as **Greg Bailey** ("real problems cheerfully considered, reality loosely defined") and **Donald M. Brown**, author of *MockPackage, MacBillboard,* and *The Wonderful World of Eamon.* Mind amplification engineers like author **Howard** *(Tools for Thought)* **Rheingold** were there, as well as hackers from outer space such as **Timothy Leary**, who is under contract with Activision to produce three "mind movies" based on **William Gibson**'s hacker cult classic *Neuromancer*; and cybernetic historians-cum-process engineers like **Nickey Atchison**, of Ferranti Interdesign, who has rewritten the history of Western culture from the early Samarian to the sixteenth century based on his theory of "the cultural relativity of reality."



The articulate Col. David Hughes (left), a self-avowed fundamentalist for freedom, threatened to shoot it out with Star Wars-Hawkish computer columnist and sci-fi writer Jerry Pournelle (right).

One hacker even achieved the world's first "four-billion-mile hack": **Jonathan V. Post**, the engineer who was chiefly responsible for hacking the historic photos of Uranus and its moons ("My favorite is Miranda") taken by the Voyager spacecraft.

For my money, the most interesting character at the conference was cowboy-hatted, string-tie-sporting **Col. David Hughes,** a self-avowed fundamentalist for freedom, who threatened to shoot it out with Star Wars-hawkish computer columnist and science fiction writer **Jerry Pournelle.** Col. Hughes, a "saloon journalist," runs Roger's Bar in Colorado Springs, where beer-quaffing truck drivers can debate matters of public policy over his computer bulletin board with generals from the Pentagon.

Still Hacking

The conference proved one thing: that hackers are alive and well–and on The Well. There is still a vibrant hacker community, and it is still having a significant impact on personal computer development, beyond the scope of their limited numbers and sometimes meager resources. Many, like Apple's Espinosa, are now in key positions in the industry and are forces to be reckoned with.

The camp setting made for a very relaxed event at which the creative spark was evident. **Robert Carr** said he came to "feel the pulse." Ideas were exchanged freely without fear of repercussions. You could be lively or deliberate, or as egotistical as you liked, and no one was mean or hard-hearted. **Jerry Pournelle**, who was trying to establish some sort of a power quorum with his Star Wars diatribes, was the notable exception.

After spending a couple of days visiting with the visionaries, I came away with the impression that the hacker community is more conservative than ever before. Certainly still outspoken, but with more diverse viewpoints, they aren't nearly as radical as in the past. Only a few advocated that software should be free. The atmosphere has changed a great deal, partly because of the end of copy-protection. That battle is already over, and there seems to be more harmony among the hackers and the industry.

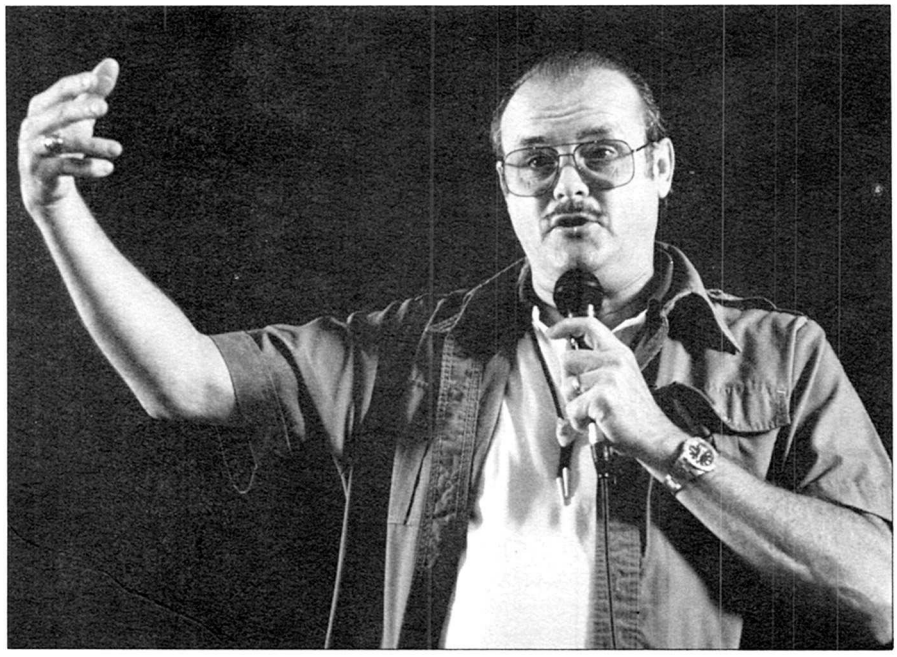
But brewing under the surface at the conference were new concerns and new issues confronting these maturing misfits of technology.

Issues and Answers

Midway through the first Hacker's Conference, the gathering began to focus on on-line bulletin boards. This year the emphasis was on the future. We all know that lots of changes will be occurring during the next five years. The CD-ROM, the 386, and the Open Mac are only the tip of the advancing iceberg.

There was a focus on networking and on-line communications, but the questions were phrased differently: Why aren't our PCs linked yet? Why aren't we using the modems, bulletin boards, and electronic mail we already have? Why isn't there better software for doing these things? Look at the success the French are having with on-line Videotex. Why do we disdain Videotex so much, and why don't we see that this is an area that has the most exciting potential for boosting PCs into homes, schools, and businesses?

We could turn the PC into a window, a machine through which all this information flows–our memos, E-mail, technical data, and conferences. When this happens, we will really see the growth of computers. Until then, we can only hack and dream.



The New Breed

Worrisome to hackers is the sense of impending schism, a generational divide between the elder statesmen and the unruly no-shows. Very few young hackers were present. Where are they?

"We are the new technology elite," **Chris Espinosa** bemoaned. "We're talking about stuff that isn't even new. But we are going to see in the next few years a segmenting of the hacker community. The companies and us will be working on the new technology and moving it forward. And there will be a wave of hackers behind us who are essentially scavenging–the Road Warriors of software."

The PC is like the Model T. People customized their Model Ts in different ways. Some turned them into little delivery trucks, while others transformed them into sportier luxury cars. The second wave of hackers will turn their Apple IIs and power PCs into microprocessor Frankensteins and hard disk Golems.

Hatchet Job Award

This award goes to **Jerry Pournelle** for pulling out a double-edged axe from his rucksack and wielding it the first night of the conference. "I came here to hack!" he cried. The hackers within striking distance did a slow scan on his equipment and pronounced: "Double-sided, double-density!"

The 85.6% Solution

Donn (Bald Eagle) **Parker**, Senior Management Systems Consultant for SRI, has the number to suit all occasions: 85.6. His new, as yet unpublished book, *The Numbering of America*, offers a sharp look at the new scourge of America. "It used to be illiteracy," he says. "Now it's innumeracy. I got started worrying about numbers because I became the guru of computer crime statistics. Journalists would take numbers from my tabulations and publish them as if they were representations of the entire problem, which they absolutely are not." Parker's revenge: Any time anybody asks him for statistics or figures, he offers the believable-sounding but meaningless 85.6. When he's asked "85.6 what?" he replies, "85.6 whatever."

Making Whoopi

It used to be tune in, turn on, and drop out. Now it's "punch in, jack in, pull out, and get to the point, especially with this audience," **Timothy Leary** noted as he chatted with author **Howard Rheingold**, who's working on a "mind amplification" tool for Activision. "What we really need is a mind-erase program," Rheingold observed. "People are restricted from changing what they know. We need a tool to leverage everything out of your head and let something new in."

"We should do that to Reagan," commented Leary. "Just think what would happen if you took a speech by **Jerry Falwell** and replaced **Whoopi Goldberg** for every occurrence of the word Christ."

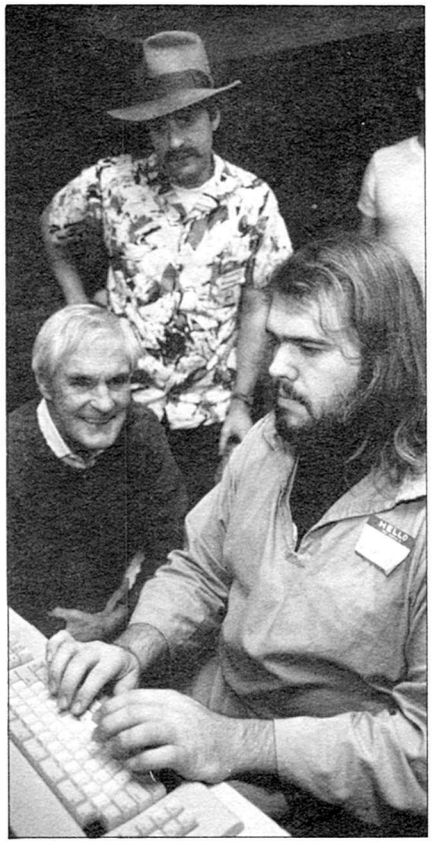
Blank Mail

Hacker poster artist **Roger Gregory** was grousing to **Glenn S. Tenney**, conference organizer: "You didn't put my phone number or my net address on the poster so people have to send me stuff by paper, which I don't read."

Diamonds Forever

Buddy Diamond, Chairman of XOR Corp., a self-described pioneer in "anthropotronic engineering" and an adviser to the National Security Council "on how to cut costs in Central Europe," was describing a fellow hacker in anthropotronic terms: "He's the original polymorphic leucocyte, but he's a friendly one!"

In the meantime, Buddy is bringing out a Mac version of his best-selling *NFL Challenge*, and he's got some new marketing tricks up his sleeve. "We're becoming Publishers' Clearinghouse," he said about his 325,000 direct-mail effort, which offers prizes (tickets to NFL games). "We've got to get around the dealers," he said.



Hugh Daniel hacks as Timothy Leary (seated) and Howard Rheingold look on.

The Message

Upgrading McLuhan, **Howard Rheingold** described the bulletin board medium as the new tool for social connecting: "The message is the address," he says about communications systems like The Well. "The experts you contact don't know who you are or where you are, but they know what the subject is. It leads to an interesting coalition of minds working on the same problem. A 12-year-old could be discoursing as an equal with a Nobel Prize winner."

Hackers' Heaven

It was happy hour for the hackers in the equipment room. You couldn't pry some away from Maze Wars. A total of eight players–on eight Macs–simultaneously played the game. **Hugh Daniel**, Project Xanadu programmer and keeper of The Well, was delving into a 3-D program by 3/D/Graphics on the Sun workstation. Someone asked, "Is that a personal computer?"

"This is what I consider a personal computer," Daniel replied, refusing to be unseated.

Askin' Raskin

Jef Raskin, CEO at Information Appliance, Inc. and whose SwyftCard and SwyftDisk use one button to handle all disk operations, was describing the state of grace associated with the ideal interface. "Say, there are two alternative commands, each of which is faster than the other in some situations. If the time saved by using the 'right' alternative rather than the 'wrong' one is less than the time taken to decide which one to use, it will be beneficial to provide only one alternative, since the total time and effort will be less." This is part of what Raskin calls the principle of "monotony."

The Interface Debate

"What is the difference between easy to learn and easy to use?" the hackers were asked. Should there be a distinction between an expert and a naive user in terms of designing an ideal interface for a program?

Ted Nelson suggested one ideal prototype for tomorrow's office systems that was familiar to everyone. "You can learn PacMan or Ms. PacMan, which is the upgrade, with two quarters....Yet how many people have read the manual?" he challenged. The different interactions are revealed to the user as he progresses, Nelson noted. "The office systems of tomorrow must allow the casual user to come up and start poking, and get satisfactory results within the limits of that poke–and gradually to be self-revealing in the same way as PacMan."

Gus Fernandez, a Macintosh software developer at Apple who is especially interested in visual programming environments, begged to differ. "There is a much more fundamental distinction between games and products," he maintained. "With games you are actually looking for new experiences, looking to see what is beyond the next door, trying to see what is beyond the next level. With products, you are interested in getting your work done with as few surprises as possible."

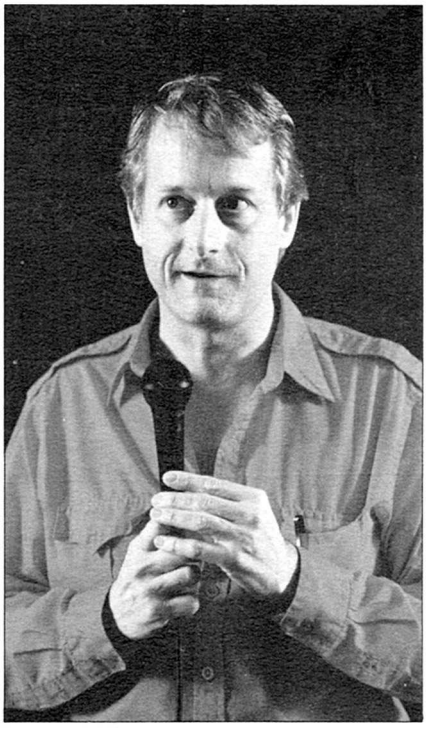
Shareware marketing pioneer **Bob Wallace** thought there should be something for everybody. "People tend to be diverse," he said. "Some people are very visual; then there are those who will want icons. Some people are verbal–they like commands. Some are piano-player: They peck, they like control, they like WordStar. I don't see why we can't accommodate all those people at once."

The Features War

Scott Wiener, founder and head of R&D for Ann Arbor Softworks, added his two bits to the interface debate: "Thinking about the Macintosh, what we found is that the Mac interface isn't so much a destination as an origin. You write a product that adheres to the interface; it gives the user a safe house and a set of things he can do in a way that cuts across applications," he said.

"The problem is that we're in a features war in the real-world marketplace. No one wants to write a product that does things that their marketing people can't talk about, because then they are not getting the most bang for their buck," Wiener lamented.

"What we're doing is based on a different approach. What we'll build into the system is something that's incredibly more powerful and that people can explore at their own pace and find out that the product is a lot more sophisticated than they started off thinking it was.



'The office systems of tomorrow must allow the casual user to come up and start poking–and gradually to be self-revealing in the same way as PacMan.'

Ted Nelson of Project Xanadu

"What it really means is, you have freedom as a developer. We are into aesthetics at Softworks. We want to extend the user interface of the Mac without having to apologize for it. Because you're not trying to cram things into some system that already exists, you can extend it in new ways."

New Definitions

Because he coined the term *hypertext*, **Ted Nelson** was asked to dust off the historical definition. It was like asking Sinatra to sing "My Way" with footnotes. Of course, Nelson obliged.

"I define it as nonsequential writing. We've been doing it for years. We've been speaking hypertext all our lives and never knew it. It's essentially nonlinearity of speech. The fact that pages have to be numbered because of the way books are built has led us into thinking that things need to be in sequence, whereas the best expositions are those you pursue yourself through nonsequential structure."

Nelson was far more interested in a newer, fresher archetype–"virtuality"–as a means of addressing the interface ideal. "That's a far more productive concept," he said. "A movie is all virtuality. Virtuality is the seeming of the thing rather than the physical reality. In a movie, you deal only with seeming; nobody cares if the set is made out of cardboard, Styrofoam, or metal. Few things have no virtuality, meaning that you don't want their conceptual structure to be revealed. That's the fish hook.

"I define virtuality as two things," Nelson posited. "The conceptual structure and the feel. All autos have some conceptual structure: front, back, left, right, taillights. But the feel is what you pay for. It's the door slam, the gloss, and the girl in the ad. The same thing is true for the computer system. The fine-tuning of the video game, for example.

'What we're doing is making [users] like us, but that's the only way they can be happy.'

Chris Espinosa, Manager of Developer Support, Apple Computer

"The object is to design virtuality, to design conceptual structure, and to work out the way it should feel. It is the design of conceptual structure that is primary; implementation is secondary. You have in your mind what you want to build; then you make it happen. It's working backward from the vision, like a moviemaker, rather than saying, 'Well, we've got a pretty good command here. This will form the nucleus. I guess the next thing I'll do is....' So much software has been done that way, which is precisely why it is so hard to use."

Narcissus Complex

"Face it, what we are talking about here is ego," said **Chris Espinosa**, striking a programmer's nerve. "If you have a system that is trying to outsmart the user, the user is going to feel offended, their intelligence is going to be belittled, and they are either going to try to outsmart the computer, which is going to be hard, or they are going to dislike it because it is smarter than they are.

"When you can empower [users] to make your application theirs–to customize it for their purposes–that's the degree to which you are going to increase people's satisfaction and productivity. What we're doing is making them like us, which may or may not be a good thing, but that's the only way they can be happy."

"Are they happy?" **Tom Mandel**, Senior Program Manager at SRI, asked. "Some are, some aren't. They don't know."

Now You See It

Ed Kleban, Director of Advanced Technology at Ken Orr & Associates, cited his favorite programming language: visual programming. His favorite application: building a pinball machine. "You pick up a flipper, put it here; pick up a chute, put it here; pick up your paintbrush, paint it green, and put your initials on it. I like it because the environment to adapt it in is the same environment that I'm going to use it in. Visual programming is a very big thing with lots of neat, exciting things coming. That's the level I'd like to see–the ability to put adaptability into my tools."

Nixed Metaphor

Which came first, the chicken or the metaphor? **Lee Felsenstein** is more literal when it comes to abstraction. "I'm still on the side of metaphor," he says. "Everybody has to compare what they are seeing now with what they know. The problem is that the part of technology we are working in makes it possible for us to leap way ahead of the metaphorical development that we should be doing, so we don't do that metaphorical development [of our programs]."

Ted Nelson was adamant: "It can't be evolution; it has to be by huge leaps. *Sketchpad* had no metaphor, no precedent, and it is still only available in a pale version as *MacDraw*."

Chris Espinosa chimed in, "It's nice to have somebody on the team–if there's this big well-funded team–but who's in charge of the metaphor? This is really the key person. We can do our job properly, but if the metaphor keepers blow it, we've lost our life line."

Gus Fernandez had his own insight: "Pretty soon things become themselves and don't need the metaphor nearly as much. For example, the Macintosh desktop metaphor. You're still talking desktops and icons, but you are really not thinking in terms of desks full of paper. You are thinking about them as entities unto themselves."

Meaning Factor

David Thornburg, owner of Innovision, was bemoaning the fact that it's still easier to get shelf space for a product that is yet another word processor or yet another spreadsheet than it is "to go into a product that lets you gobble your zits, because nobody knows why you would want to do that or even what it means to do that."

To which one hacker retorted, "Do you think that porkbelly commodity futures are any less abstract than zits? What I'm saying is that every application has its own levels of abstraction, which you can't really bring over."

Paradigm Lost

"If you ask people what they want, you'll make a thing that's known but you'll never make anything new," remarked **Brenda K. Laurel**, Director of Product Development at Activision. "The paradigm is if I had gone out in 1958 and asked people what they wanted, nobody would have said they wanted a plastic hoop that they could rotate around their hips."

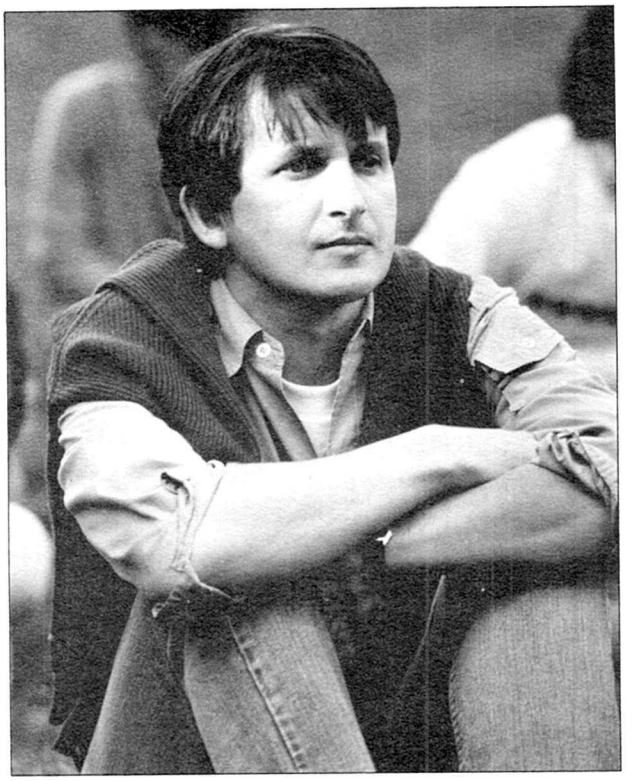
One hacker disagreed: "I would have!"

Designer's Kludge

Charles Simonyi, Manager of Applications Development at Microsoft, was discussing the kludge factor in software design. "If somebody wants feature *X*, you give them feature *X*. Then somebody says, 'Give me feature *Y*,' but adds, 'I don't like feature *X*.' We tell him, 'Great, we're going to make feature Z, which turns off feature *X*.' "

The Future

At a session on the future of software, one hacker was having an existential midlife crisis. "How am I going to start modifying myself to live with all the possibilities I can be when I'm processing a computer? How do you unperipheralize yourself and take out the interfaces you have without feeling like you're having pieces ripped out of you? How do you feel that you are really part of society–not just a hermit in a shack living away from the rest of the world?"



Charles Simonyi, Manager of Applications Development, Microsoft

Robot Sweepstakes

As the moderator for that session, **Ed Kleban** asked his hacker wards to envision "the next real goodie along the line that we can foresee, and it's not CD. It's something that nobody's got one of yet. What is it?"

Answer: Hackers love robots, and even the most indigent hacker would scrape up as much as $10,000 for a "real genuine robot."

What would they do with one? Here is a cross-sampling:

"One of my hobbies is building model trains. It would be really neat if I had little model people on little model trains."

"I want mine to have little adventures, see what's over there and come back and tell me–do fun little things that I haven't got time for. 'Go sit in this meeting for me. I don't want to be there.' "

"There's going to be regional gravel pits where you send your little robot tanks out to fight against somebody else's tanks."

"The demand for robots will definitely increase because of all the little kids who grow up watching 'Transformers' and 'Go-bots.' "

One hacker dissented: "One of the things about computers being used in executive offices is nobody is going to use a computer, especially an executive, when he's got the best voice recognition system sitting at a desk nearby. It's called a secretary."

Another hacker wondered, "Are people going to have affairs with their robots?" Someone replied, "Undoubtedly some will."

"I'd like my robot to drive my car looking for a parking spot, and move my car around so I don't get a ticket," one hacker said. "Great!" another snapped, "The streets will be full of robots running people over. The lawyers will love it."

The most practical hacker in the group said, "I want my robot to build five more, and those five to build 25 more."

Bio-Hack

Scott Wiener offered a prediction: "Bio-technology is going to make computer technology seem unimportant." **Hugh Daniel** one-upped him: "I predict that neuro-technology is going to make bio-technology seem unimportant." To which Wiener responded, "And I predict that we'll have bio-technology at least 30 years before we'll have neuro-technology."

The discussion then got a bit out of hand. How do you define bio-tech?

"It's getting creatures to do things for themselves, like using DNA to make a virus to make interferon."

"We're on the single-cell level right now, right?"

"No, we already know how to make elephants."

"Yeah, it's real easy, all you need is two elephants."

"But they can't make a toaster."

"MacScience is working on it. . . ."

$100,000 Reward

Ed Kleban challenged the hacker assembly: "I want to hear the software version of 'Name That Tune.' " He offered them $100,000 for one year's work. If they could do anything they wanted, what kind of a program would they deliver by next year's conference?

"You are going to have to sign a contract, guys," he said, "although I'll be fairly lenient. But you are going to have to buy your computer out of that $100,000. If you need a Mac and you need to go out an eat sushi every night, those are the trade-offs you have to make."

Someone groaned: "There goes the hundred grand." Kleban backed off, "Okay, one should never put a hamper on creativity. I'll give you free access to the workstation of your choice." One hacker griped: "One is not enough!" Kleban was firm: "I don't want a major program project that will take ten people. You use a VAX, an Amiga, a Sun, a LIST machine, something realistic, something you can get today."

The following are some proposals:

"Your own morning newspaper. However you want it, from around the world, whatever stories, whatever editorial slant you want. If you don't like right-wing stories, you don't like left-wing stories, if you like a little *Weekly World News* in your morning newspaper. . . . The information is there, it's on the wire. All you need is a machine that can pull it out, go through it according to what you want, and learn as you read. It's got to watch you read the news to see what stories you like and don't like, and analyze the stories that are coming in and ask, 'You think he's gonna like that?' "

"Okay, I'll sign the contract on that one," said Kleban. "You got your hundred thousand."

"A novel-generation program, whether it be romance or generic sci-fi," one hacker began. "Novel Writer, University of Wisconsin, 1976, that was a prototype," another hacker cut in.

"I know of no one at Softworks who can write a program without having at least one other person to argue with," mused **Scott Wiener**. "Hey, if you have to pay ten grand a year for someone to argue with, that's your own problem, your own hang-up," Kleban retorted.

Chip Morningstar, a designer/programmer for LucasFilm, proposed, "In a year I'll deliver to you, on my ideal workstation, a bunch of pretty graphics programs that make pictures that I think are beautiful."

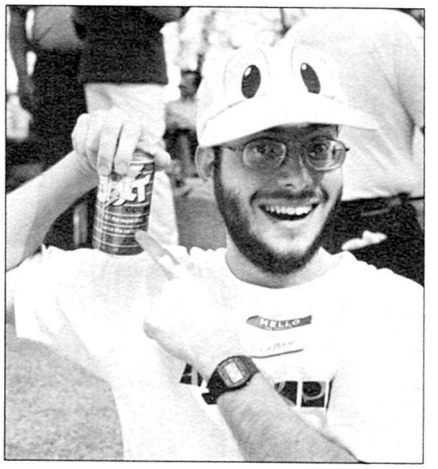
"Will I enjoy them when I see them?" said Kleban, wanting some assurance.

"I don't know," Morningstar conceded.

"I think you need to work a bit more on your specs," Kleban advised.

One hacker suggested, "The networked 3-D combat program with 3-D sensors on every part of your body." Kleban bought the project and ordered ten for the next hackers' conference.

Russell ("Wuthel" in LISP) **Brand**, an MIT hacker now transplanted at the Lawrence Livermore Lab, proposed "a text analysis system that will go through your diary and stop you from f-----g up your life. I want something that says, 'The purchase you're being pressured to make is. . . . ' "



'Visual programming is a very big thing, with lots of neat, exciting things coming.'

Ed Kleban, Director of Advanced Technology, Ken Orr & Associates

The Next Step

What's the next software thing that hackers need? "What's going to make our bit-twiveling lives easier?" Kleban posed.

"A truly personalized computer that the longer you operate it, the more it learns your quirks, the better it gets at anticipating you, the better it gets at reading your mood. You wouldn't want someone else to use your computer any more than you would want someone to use your toothbrush," one hacker noted.

"When I can't tell the difference between my computer and my little brother's personality, it will have arrived," another hacker pontificated.

"I want something that acts sort of like a mentor friend," said one. "It doesn't go out and do everything for me, but it says, 'Hey, I was reading the paper, and the stock you've got just halved in price. Pay attention!"

Kleban asked, "You want an electronic Jewish mother?" He added, "You have heard all about the new products coming out from the major car firms in terms of ethnic speech synthesizers and the Jewish mother model that says, 'You're leaving your lights on, you don't like me anymore."

Sightings

The first packet radio, designed by **Mike Bentley**, a Chicago software engineer who specializes in process control, CAD/CAM, and weaving "untangled webs for industry."

Chuck Moore's Forth on a Chip, a homemade portable computer resting inside what looked like a homemade briefcase, "is one-tenth as fast as a Cray," he said.

Release 1.0 of Jolt was launched at the conference. No, it's not a software program; it's a cola. (The label boasts "All the sugar and twice the caffeine.") The company donated a few cases to try out on the hackers. "They're never going to make a healthy cola so they quit trying," **Mike Bentley** commented. **Jan Lewis**, from the Palo Alto Research Group, who'd been up all night, gave a testimonial: "I had three Jolts in the last hour, and I feel great!"

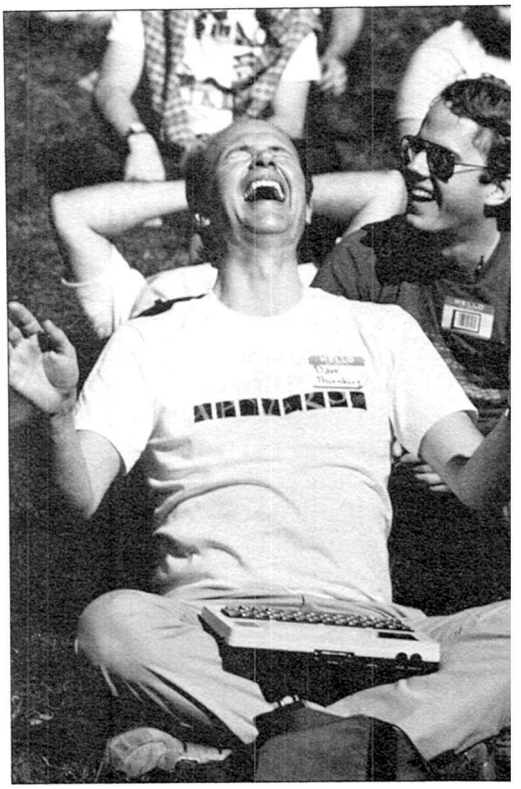
Jim Edlin, President of The Softer Interface, reported, "I'm sort of doing things cafeteria-style these days. I've got four to five projects, and I'm still selling *Wordvision* out of my kitchen." Edlin says he's been "captured by the vertical muse" and is about to test a newsletter aimed at PC applications in advertising agencies entitled *Edlin's PCs in Agencies Newsletter*.

Lost at Sea

Steve Wozniak was conspicuously absent this year. The rumor was that he had been offered a free gambling junket on a new cruise ship.

The Establishment

Todd Rundgren, best known as a musician with interests in "high-performance music combined with high-performance graphics," said he was surprised to note that the hackers at the conference do not appear to be "prepared to make a commitment to the next level of technology. They're essentially happy "just writing to the machines they're already writing to," he noted.



'We don't need glitz. We don't need Regis McKenna.'

David Thornburg of Innovision

"I think there's an aura of the hacker establishment here," he observed. "There's a heightened economic urgency here that I probably didn't expect because a lot of people are now in business, as opposed to doing it for the fun of it."

"I haven't heard a lot of concrete new things here," Rundgren said. "Xanadu is an old thing. The biggest new thing here is an old thing.

"I was hoping for more than a Rotarian convention," he said. He suspects that the hackers are waiting to see what IBM does next.

Exclusive Excerpt

Here, exclusive to *Subroutines*, is the first paragraph from **Jonathan V. Post**'s unpublished hacker novel: "Yes, I'm a mad scientist. But you'd be mad, too, if they did to you what they did to me. They called Bruno mad for suggesting that there might be an infinite number of worlds, and they burned him at the stake. They called Galileo mad for looking at other worlds and kept him under house arrest." Let's hope they don't arrest Post and burn his manuscript.

The Neuromancer

Timothy Leary, guru of bygone days and hacker of the third eye, came to check out the action. Leary has a three-product deal in the works with Activision to do "mind movies," based on the William Gibson hit tome *Neuromancer*, which is also being produced as a film.

Leary's mind movie is quite a major production, too. It involves the work of four writers and four technical people, including **Kevin Piette**, co-author of *MultiMate*, **Jojo Hansen**, one of the programmers for *NFL Challenge*, and **Mickey Wozniak**, the Director of Project Management at Ashton-Tate. Leary has also brought in artists **Keith Haring** and **Peter Max** and photographer **Helmut Newton** to contribute in the graphics department.

Neuromancer, the mind movie, will feature eight acts and a total of 128 scenes, which the player can design and redesign. Players can also select real life actors such as **Dennis Hopper** or **Grace Jones** to play certain roles. The player chooses the level of production: blockbuster, art movie, documentary, and so on. In the end, it faces algorithmically generated critical reviews. When the game is finished (it takes 2 to10 hours), the player selects screen mode and can view 5 to 15 minutes of graphics and text scenes.

Nancy Blachman and Lee Felsenstein dancing at the costume ball hosted by Borland International. Nancy has been hacking software for 14 years and currently works at the Research Institute of Advanced Computer Science in Palo Alto. Lee is President of Berkeley-based Golemics.

"There are literally trillions of ways to do the film," Leary says. And if that is not enough film-making for him, Leary's company, Futique, has the mind-movie option on the upcoming *Rafferty* film featuring the new, high-tech James Bond character.

"We want to position ourselves for CD-I," Leary said.

That's Entertainment?

Borland President **Philippe Kahn** sponsored a gala Halloween ball for the hackers on Saturday night. He sent, compliments of his perverse sense of humor, a dance band to provide the evening's entertainment. With 180 men and 14 women in attendance, I ask you, Philippe, *et tu, Brute*?

On the last day of the conference, the hackers voted to have the event every year, but to be sure to invite more women.

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The photos in this issue were taken by Matt Herron, except the one of David Hughes, on page 2, which was taken by Jim Warren.

SUBROUTINES
David Bunnell's Newsletter From Inside the Personal Computer Industry

VOLUME 5
NUMBER 11
DECEMBER 1986

LASERLETTER

Back to College

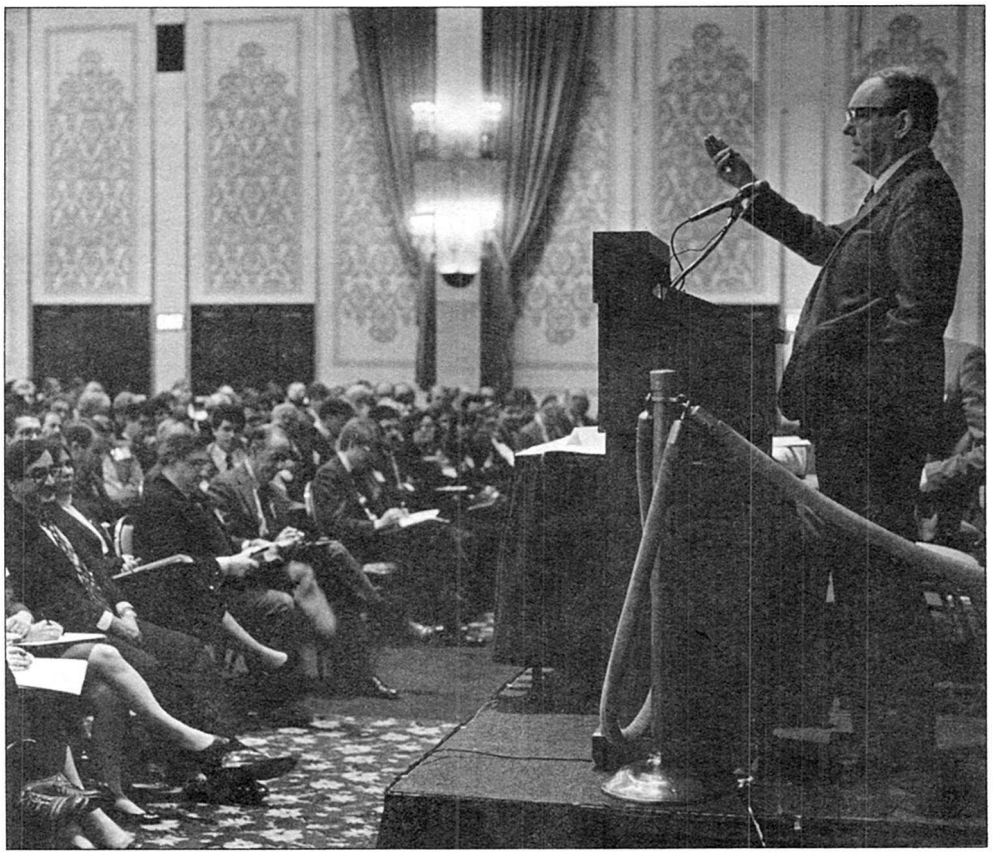
Pittsburgh Conference Portends Vigorous New Market in Higher Education

Borland's impromptu jazz party at Comdex, Las Vegas, was jumping. Seeing President **Philippe Kahn** wailing on his sax under the neon sign "Turbo Jazz" struck me as the high point of the show. I knew it was destined to go downhill from there. That was only Tuesday, November 11, of a show that ran from November 10-14.

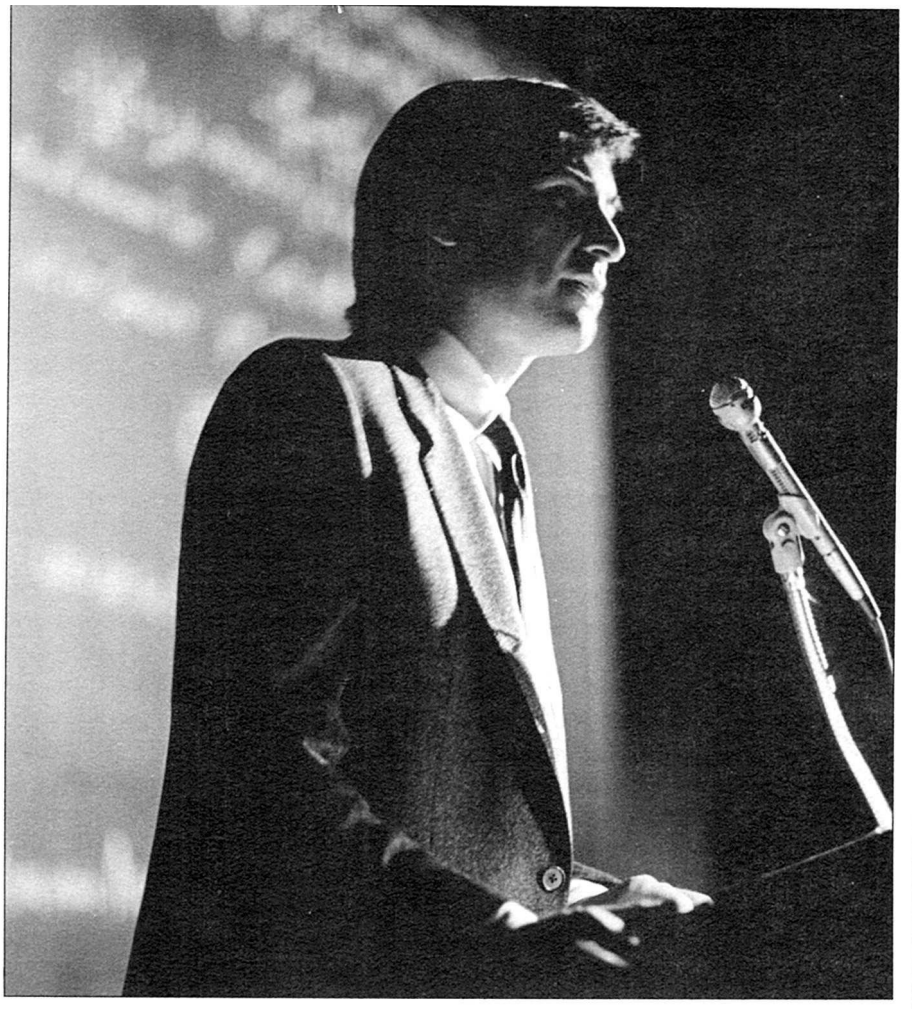
I decided to catch the 7 a.m. flight the next morning for Pittsburgh, where I suspected more significant things might be happening. I turned out to be right.

Educom '86

The national educators' Educom '86 conference in Pittsburgh (November 11-14) was perhaps one of the single most stimulating events in personal computing in the last several years. The fervor and the excitement, the intensity of the ideas, and the high level of activity reminded me of the first West Coast Computer Faire, in 1976.



Carnegie Mellon Professor and Nobel Laureate Herbert Simon gave the opening address at Educom '86, held at the Pittsburgh Hilton and on the campuses of Carnegie Mellon and the University of Pittsburgh.



'The real breakthrough is going to come through key people on some of your campuses.'

Steve Jobs, President, NeXT, Inc.

Co-hosted by Carnegie Mellon University and the University of Pittsburgh, Educom '86 was the annual meeting of a consortium of some 450 North American universities and colleges and 60 corporate associates. Educom is a nonprofit association that serves as a resource for higher education institutions that want to learn more about the current and emerging trends in information technology.

The Educom conference serves as a forum for the exchange of ideas on computer applications in all aspects of academia: teaching, research, administration, and communication. The 1500 conference attendees comprised professors and key administrators who are responsible for planning management and purchasing computers and software for their institutions. They came to Pittsburgh to compare notes on the new computing revolution on campus, that long-awaited reshaping of higher education that's finally becoming an academic and economic reality.

Revolution in Higher Education

It's high-tech with a graduate degree. It's also big business, not just a big niche. No one knows how big–the report card is not in yet–but the experts are projecting multi-billions in the higher education market, with incalculable spill-overs and product spin-offs into commercial markets.

We're talking real innovation in an industry that's gone numb with hype. We're talking breakthroughs, strategic alliances between corporations and university research labs, about putting America back on track in the face of foreign competition. What it boils down to is the future of both computing and education.

It's no wonder Apple Computer skipped Comdex this year. They sent 100 of their finest proselytizers to Pittsburgh. IBM was also there in force, easily matching Apple's numbers, plus some. **Steve Jobs**' NeXT, Inc. was there practically in toto–the entire company, including the janitor, is my guess.

Compared with Comdex's 1200 vendors, Educom had a meager showing of corporate sponsors/exhibitors. In addition to Apple and IBM, the companies represented in the demo rooms at the Pittsburgh conference were Amdahl, AT&T, Bell Atlantic, Corvus Systems, Digital Equipment, Hughes Aircraft, Interlink, Joiner Associates, Microsoft, Prime Computer, Racal-Vadic, Relational Technology, Sun Microsystems, Tradenet, and Ungermann-Bass.

I predict that by next year the word will be out about this event, and the number of computer companies jumping on the higher education bandwagon will skyrocket.

Dynamics of the Revolution

Although the annual Educom conference has a 22-year history, it was a sleepy event until a few years ago, when the micro revolution hit the campuses. The average attendance used to be about 700. This year it reached 1500. Why?

"Thousands of faculty members and administrators have decided that 1986 is the year they will have a personal relationship with computing," Educom activists **Steven W. Gilbert** and **Kenneth C. Green** explain in their indispensable overview of the market, "New Computing in Higher Education" (*Change*, May/June 1986).

"Like their predecessors, most academics now getting started in computing are professionals who haven't been computer users before and who will never think of themselves as computer experts. What they realize is that they are embarking on a journey they can no longer delay," Gilbert and Green note.

The Human Factor

Academic graybeards are beginning to feel intimidated by younger professional associates who are reporting various "productivity gains" from using PCs. Their increasingly computer-competent students make them feel insecure. They also find themselves one-upped by their school-aged children, who can tinker comfortably with both home computers and PCs. In short, they have been forced to recognize the importance of computers in higher education.

"Just like in my generation, after students swarmed over Model T Fords, the faculty, out of shame, had to get something out of it," observed Nobel Laureate (Economics, 1978) **Herbert A. Simon** in his opening address at Educom '86. He was drawing an analogy between the absorption of the automobile into American society and the acceptance of the computer by mainstream academia.

An even more far-reaching reason for the shift in computing consciousness is that educators have finally become aware that "the hardware and software of the late 1980s just might help them . . . realize the unfulfilled aspirations for the technology–for computing in the teaching-learning process," according to Gilbert and Green.

This will lead to a revolution not only in teaching but in knowledge itself.

New Accessibility

Economic factors are influencing the techno-boom on campus. Students now routinely use (and many own) desktop systems more powerful than the mainframe systems of the 1960s and early 1970s. According to the recently completed Higher Education Utilization Study, about 300,000 PCs were in use in American colleges by 1985. Other estimates put the number at 530,000 (Gilbert and Green).

About two-thirds of all colleges and universities provide some kind of financial assistance (discount prices, loans, grants, and group purchases) to students and faculty in buying computer hardware. Some 300 colleges have special purchase agreements with vendors that allow them to resell PCs at substantial discounts.

The major industry players on campus include Apple, AT&T, Burroughs, Control Data, Data General, Digital Equipment, Epson, Hewlett-Packard, IBM, Prime Computer, Texas Instruments, Tandy, and Zenith.

College Connection

You would think that the university-industry relationship would be something like the one between Church and State, but these two are more like college sweethearts.

Vendors are now sensing the dynamics of the campus market more keenly than ever before. Universities routinely purchase hundreds–even thousands–of units each year. And colleges, unlike computer stores or corporations, have an annual turnover of potential new purchasers in the form of entering students. Compared with the volatile outside market, campuses are havens of stability.

Campuses are also relatively easy to sell to once the strategic market has been penetrated. For example, once the prestige universities–such as Carnegie Mellon, Cornell, UC Berkeley, MIT, Michigan, Stanford, and UCLA–are sold on a product, it's that much easier to sell it to the other tiers of universities and colleges. Why? Because the smaller institutions are more inclined to follow in the footsteps of their distinguished colleagues when they are setting their own criteria for PC purchases.

R&D 101

R&D is where the university-industry love affair really heats up. Universities don't have the resources for all the hardware and software needed on campus, while industry could certainly use some prime brainpower in the research department, especially to develop the courseware needed on campus.

Meanwhile, the marketing megatrend of the day cannot be ignored. "With Japan dominating, Western Europe catching up, other Pacific Rim countries imitating Japan, and [the computer industry projected to account for] 15 to 20 percent of our GNP in the 1990s," the solution to the R&D gap is obvious, according to **John W. McCredie**, Director of External Research for Digital Equipment Corp., who was one of the panelists at the session "University-Industry Research Partnerships: The Next Steps."

The solution is to pump money and equipment into research projects at leading universities. For industry, this represents a relatively small investment in proportion to their total R&D costs. For universities, it's a fairly no-strings-attached godsend.

"Although most of the basic research in universities does not end up directly in products, Digital is looking for ideas, concepts, and prototypes for evaluation," says McCredie. "Digital supports more than $20 million in research annually to universities, even though most of the results of academic research eventually fall into the public domain."

John W. Alden, the Manager of Education Marketing for Texas Instruments, cautioned, "Corporations are not a philanthropy" and that continued R&D assistance depends on the direct performance of participating universities.

So what's cooking on the R&D front? The following are some general-interest areas identified by the panelists: next-generation materials ("We're going to run out of gas on silicon in the mid-1990s," noted Alden, citing TI's $2 million contribution to Semiconductor Research Corp.); developing natural language as an interface technology; object-oriented databases; symbolic architecture; speech and image understanding; expert systems in real time; and AI-based planning and AI user interfaces.

"We are dedicated to the principle that university research is at the nexus of international competition," Alden stated.

Significant Others

IBM and Carnegie Mellon tied the knot in 1982 with a pioneering agreement to develop hardware and software products specifically for the campus environment. Development of a so-called "scholar's workstation" in the form of Project Andrew promises to set a standard for the future of campus networking (see "Project Andrew" in this issue).

Also alive and kicking is the Apple University Consortium, announced in 1984. Whereas, the Carnegie Mellon-IBM deal emphasizes product development, Apple's program focuses on market development. It not only permits universities to sell Apple equipment at drastic discounts without incurring legal obligations, but Apple has begun distributing faculty-developed, Macintosh-oriented courseware in an arrangement with Kinko's Academic Courseware Exchange.

Then there's the phenomenal Project Athena, a $70 million undertaking at MIT, funded by Digital and IBM, that promises to turn education on its head (see "Project Athena" in this issue).

NeXT Semester

Although **Steve Jobs** was seen aboard a US Air flight to Pittsburgh bent over that week's *Business Week*, the cover story of which was entitled "IBM Fights Back," he was certainly in an upright position when he got to Educom. "It's nice to be back to work," he told an admiring crowd as he began his address on "The Future of Computing in Higher Education."

Word on the campus grapevine is that if NeXT, Inc. intends to shimmy through that open window of opportunity with its eagerly awaited advanced college workstation, the prototype will have to be unveiled by June '87, when the campuses make their hardware and software acquisitions for the following academic year. If NeXT doesn't make that June '87 date, there may be more competition by June '88.

The 10M Challenge

True to form, Jobs wowed his audience with his visionary slide and video presentation that could only hint at the amazing potential of his so-called 10M machine (4.5 MIPS, 4 megabytes, and one mega-pixel). "Since 1981 [when the Macintosh was introduced], your needs have grown," Jobs observed. "And it seems you want a lot more. You want a 10M machine. I guess it should come as no surprise, but you still think you should have it for $3000."

Scott Mace, *InfoWorld*'s Washington, D.C. correspondent, sniffed, "They want it all, and they want it for free."

Jobs then gave them a taste of what he referred to as "simulated learning environments." "The real promise of computing in higher education is to give people via simulation what you can't give them in reality. This is where we think everything is going," Jobs said, as he ran through some clips developed by Pixar, the company that Jobs bought earlier this year from filmmaker **George Lucas**.

A three-dimensional simulated human torso rotated in the darkness like a hologram, the surgeon's stitches visible in almost tactile yet transparent relief. In another clip, entitled "Luxo Jr.," two desk lamps bounced a ball on a table, as if that were the only natural thing for them to do.

"This wasn't possible five years ago, and until very recently it took hundreds of hours of computation on a VAX just to produce a frame," Jobs said. "We can do this today on a $100,000 machine, but five years from now I want to be able to do this on a $5000 workstation. I think we can get there."

Developing Software

As canny as ever, **Steve Jobs'** marketing strategy was at least subliminally clear: I'll deliver the hardware, you deliver the software. In order to get "history to come alive off the static page," in order for freshmen biochemistry students to get a chance "to mess around in a $5 million biophysics lab," and for economics students to reap the benefits, real and simulated, of Samuelson's classic economics textbook, the scholars, knowledge specialists, and other archivists of the collective human experience will have to get down to the nitty-gritty of developing software.

"Next year, we'll unveil the breakthrough computer that can run these simulated learning environments," Jobs promised. "It'll be 10 to 20 times as powerful [as what we have today], but that's no real breakthrough. The real breakthrough is going to come through key people on some of your campuses. It's going to come through programs which are going to change the history of how we teach in higher education and how we learn. You're the guys who know what the content is," he said.

Software Initiative

To drive the point home, Jobs awarded $50,000 to the Educom Software Initiative, a program begun in December 1985 to disseminate information and stimulate the development of commercial and faculty/student-produced courseware. $25,000 will be used for administrative costs of the initiative, and the remaining $25,000 will be given in the form of five awards next year for the best simulated learning environments. The winners will be announced at Educom '87, to be held October 27-30 in Los Angeles and hosted by the University of Southern California.

"The thing most needed to realize potential is the right incentive structure," Jobs noted as he presented his check.

His cash incentive is a masterful move. Once again, he has put himself in front of the pack. Hopefully, other companies will follow suit in donating money to the Educom Software Initiative.

Educom Code

Educom has been working closely with ADAPSO (Association of Data Processing Source Organizations) and major software companies, including Lotus, Microsoft, IBM, Apple, and Control Data, to create a software honor code. Although it is still being drafted and reviewed, the code will undoubtedly stress that campus software users recognize the intellectual property rights of software and not copy programs illegally. The honor code will likely encourage colleges to press sanctions against individuals who violate the agreement.

Educom is also working on a structure for site agreements so that software could be used at workstations and on networks. In this way, software companies could sell large quantities of software to universities without having to worry about the nightmare of piracy.

Also in progress is an Educom survey, the first 200 responses of which revealed that 75 percent of all American universities already have procedures in place to discourage software piracy. This represents a significant shift in academic policy, no doubt motivated by the urgent need to get more software companies interested in developing programs for the higher education market.

'The concept of lifelong learning is for the first time really in our grasp.'

Richard M. Cyert, President, Carnegie Mellon University

Statistics

Paul Velleman, an Associate Professor of Industrial and Labor Relations at Cornell University, was sitting at my table during the Jobs speech. As soon as I finished introducing myself to my dinner companions, he got on my case about a review *Macworld* had recently published of a statistics software package called *Stat 80*. Velleman claimed the review praised the product too much. The program didn't really take advantage of the Mac interface, he groused. It was just a straight port from a minicomputer and was an old-fashioned way of looking at statistics, he asserted.

It turns out Velleman had written a statistics program himself, one that he assured me was far better than the object of his scorn. The next day I went to see it. I must admit, it was an impressive package. It had a scatter chart with lots of dots that you could rotate in 3D. Most interesting, perhaps, was the fact that you can change the scale of the graphs instantly by moving the windows. Instead of, say, making the scale 1, 10, 20, and 40, you could make it 2, 20, 40, and 80 by changing the size of the window. In this way, you can analyze the impact of the different impressions the graph makes.

Velleman's program illustrates how easily graphs and charts can be manipulated to suit any purpose and make any desired point, no matter how unfounded.

Project Athena

Rus Gant, Senior Applications Programmer at MIT, gave one of the best presentations at Educom when he described Project Athena, a $70 million visual computing project at MIT funded by both IBM and Digital.

The Visual Courseware Lab (VCL) is one of the more exciting examples of what can be done with computers on campus. In this lab, Athena planners are trying to create the kind of software that users will want to use in the 1990s–without taking into consideration the state of technology or hardware at that time. They are designing it for the machine of the future.

One of the primary objectives of VCL–and a major theme at Educom '86–is trying to understand the actual process of how people learn.

As **Herbert Simon** stressed in his opening address, "Before the technology is really going to have any large impact on the educational system, we're going to have to have a major advance in what is now called 'cognitive science' so we have a much deeper understanding of what it is a student learns, or should learn, and what makes him capable of exercising certain skills and how that comes about. We need a theory."

Visualization

One of the key aspects of learning, VCL researchers believe, is visualization. For example, in a language lab, if students could actually see foreign language speakers moving their lips when they speak, they could learn a language much faster than if they only heard it over a tape recorder. Hearing doesn't provide the same information as visual clues.

As a result of this finding, VCL designers have defined an educational system that includes a scholar's workstation. The workstation features a natural language processor, high-resolution graphics, digital motion video, advanced window management, and digital audio. As Rus Gant explains, it's designed as a "blending of video and computing. It has to do everything video did previously, and then some."

The VCL System

In building the VCL system, MIT scientists are currently utilizing Digital VAX workstations and IBM PC RTs. Although they realize that these machines aren't cost-effective, they are anticipating using a scholar's workstation (from whomever brings it out first) and running advanced versions of Berkeley Unix on it.

Building a standard user interface with graphics-oriented windowing is their highest priority. They envision it including a pedagogical authoring environment, which will make it easier for both faculty and students to write programs. VCL developers are assuming that they will have optical memory in this system.

"The best way to eliminate memory limitations is to go optical," notes Gant. In creating the software for this system, which blends video and computing, "one has to think like a filmmaker." It's a completely different kind of process than what we're used to, he says.

Electronic Reference

One of the areas of current courseware development is neuroanatomy, Gant reports. The MIT scientists are creating a high-density electronic reference book featuring the neuroanatomy of the human brain.

The purpose is to create an explorative anatomy and to see all kinds of shots of the human brain in 3D. You can rotate the cerebellum or medulla oblongata and jostle all that gray matter in the cranial cap, zooming in and out on different areas. Interestingly, this "reference" work has no beginning, middle, or end.

The MIT team believes they are creating the first electronic books. It is important, they claim, that these books be reference books–not textbooks. They are designing tools to support teaching–not to substitute for teaching. "We would like to have an impact on students to spend more time with teachers–not less," Gant hopes.

Sky's the Limit

The VCL workstations are networked utilizing parallel Ethernet and broadband cabling. Broadband offers the fiber optic cables for transmitting video images, while the computer communications go through Ethernet.

Using this network combination, the VCL team has devised extraordinary biology courseware that simulates an electronic microscope. When the computer zooms in on an image on the VCL system, it is actually accessing a series of pictures from the database that become progressively smaller or larger. This is a vast improvement over blowing up or reducing a picture electronically.

Following the microscope model, MIT professors are developing a telescope simulation that will enable students to explore the stars. Another simulation in the works is one in which a submarine dives 20,000 feet in the Atlantic. More than 50,000 underwater images are stored in the database. It will be just like some Jules Verne fantasy coming true.

Parlez-Vous VCL?

The Athena Language Project represents an exciting breakthrough in language instruction. MIT linguists have devised different approaches to studying French, German, Russian, Japanese, and Spanish, utilizing both video and computer. For the purpose of the experiment, each language is pursued via a different technology. For example, the Spanish program features an interactive fictional narrative based on a mystery story set in and around Bogota, Colombia. According to Gant, the concept is that to learn a language better, you must be able to simulate the culture. "Culture is a very large simulation," he avers.

The French program, however, is reminiscent of Project Aspen, the interactive videodisc guide to Aspen, Colorado. The system is optimized for language situations. Students walk around Paris, enter shops, and talk to salespeople, or if they select a passive mode, they can just observe other shoppers conduct business.

As student-strollers reach Notre Dame during their linguistic perambulations, they can switch mid-stream to another source for related information. If they are interested in architecture, for example, they can switch to an architecture database and learn structural details about the building itself–in English–and then switch back to the French language database when they are finished. This method of learning has enormous implications for the future of education.

This concept is at the very heart of the Project Athena system. Every course will have access to the same central databases. No information is separated or disconnected from the whole. The MIT Athena researchers are striving to create different databases in the form of those so-called "electronic reference books."

As such, Project Athena amplifies some of the same ideas Steve Jobs is espousing with his simulated learning environments.

A Class Act

Educom '86 was a class act. It was the first time I have witnessed so many potential users who are actually creating their own software and trying to influence what kind of hardware they will get in the future. When did you last see that in the business world? When does the Chamber of Commerce award prizes to fellow members for writing software–or, for that matter, lobbying computer companies to build advanced workstations at certain price points?

The computer companies that get involved in this process are going to reap huge benefits because they are dealing with a user base that gives lots of feedback.

Too bad it's so different in the business marketplace. There you have a user base that's holding the personal computer industry back, in a sense. They don't want hardware to advance too fast because they have such a big investment in the existing hardware. And they want everything to be standard–even if the standard ends up impeding progress and stifling creativity.

It's clear to me that the focus of really creative computing–of pushing applications to their limits–has shifted from corporate America to campus America.

Halls of Carnegie

The spirit of Andrew Carnegie, the American industrialist who helped forge America's Industrial Revolution, is still propelling the future in new forms. You can still sense Carnegie's presence, now transmuted into RAM, the steel of the computer revolution. It's buzzing on the Campus of the Future, with its "information kiosks" at the University of Pittsburgh, and it's incarnate in the aptly named Project Andrew network at Carnegie Mellon University. If America's enterprise–all brawn and bravado, blood, sweat, tears, and soot–got its start in Pittsburgh in the nineteenth century, how appropriate it is that the computer revolution is being forged here as well, in the blast furnaces of university research labs.

Project Andrew

Andrew is the most ambitious networking system ever envisioned. With IBM's generous support, Carnegie Mellon is building a distributed system capable of connecting more than 10,000 computers on one network. They have already completed the wiring on this massive project. Every dorm room, classroom, and computer facility on campus can be plugged in.

When it's completed, the campus will have 3000 advanced workstations and 10,000 Macs and PCs–all communicating with each other. The university already boasts about 1400 PCs hooked up to the system and 3100 active users. Bulletin boards are set up, and an electronic mail system gives students and professors personal access to each other.

The key to Project Andrew is something called VICE, for "vast integrated communications environment." Carnegie Mellon plans to have four VICE installations on campus. They will even have external distribution so that off-campus users can connect with the system.

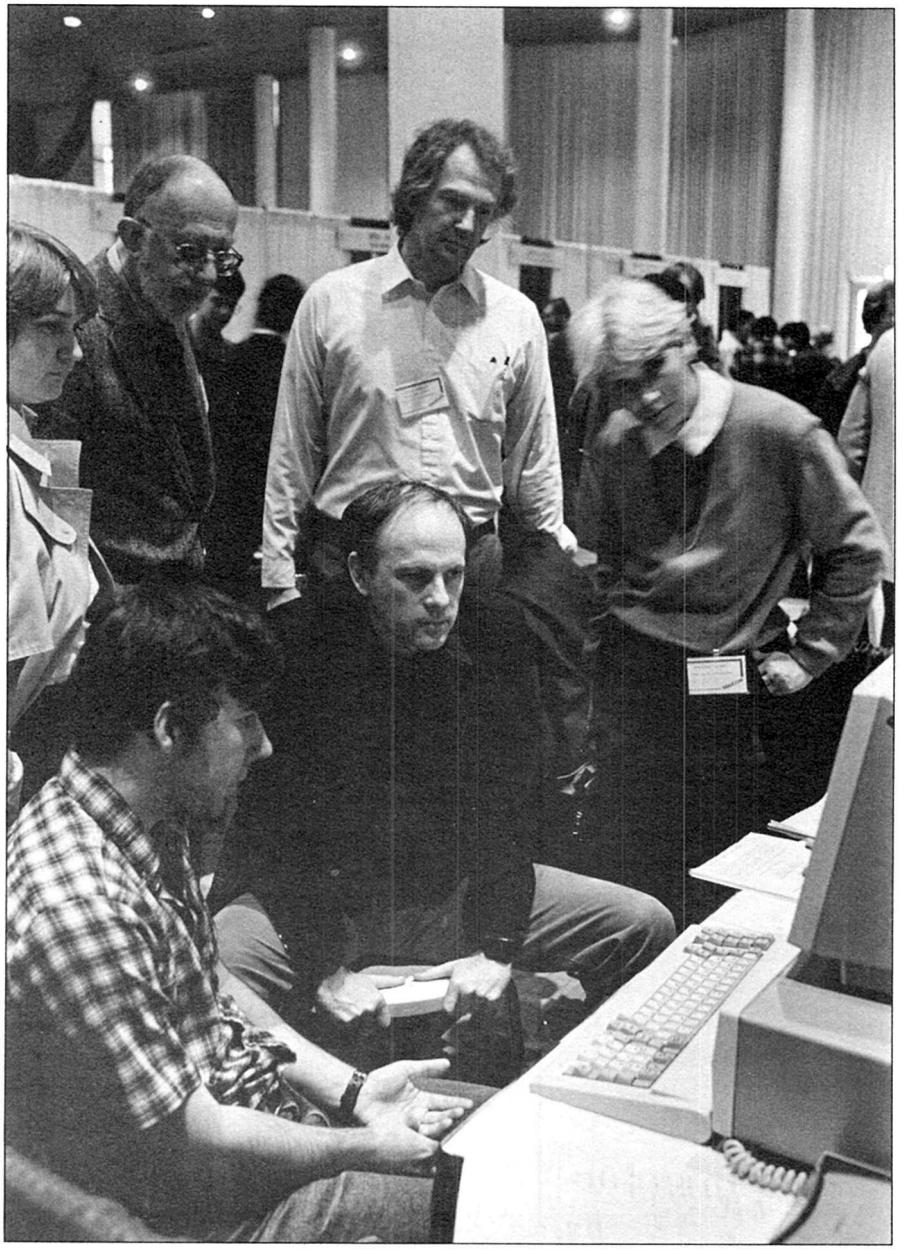
Lifetime Learning

Carnegie Mellon President **Richard M. Cyert** explained this educational breakthrough: "One of the key ideas in this revolution is that we now have a chance to have real lifetime learning for students who become alumni and professionals. After they leave the university, they will have the ability to tap into the network from the outside, as well as the ability to develop material in the form of disks and other methods that they can buy . . . . This will enable us to continue to educate alumni, so that the concept of lifelong learning is for the first time really in our grasp."

Spring Break?

I ran into **Bill Campbell**, Executive Vice President of Marketing and Sales at Apple, in Apple's hospitality suite on the 24th floor of the Pittsburgh Hilton. (Apple occupied the Commonwealth Suite, and NeXT, Inc. occupied the Presidential Suite at the opposite end of the hall.) Campbell had just flown in from Comdex, and we were comparing notes about the show.

He confessed, "This was the first year at Comdex that I could go to the bathroom and have lunch. That says something about the show."



Educomments

Roaming the halls, I overheard some insights and impressions from some of the academics and professionals who are pioneering the new computing revolution on campus.

"Jobs was impressive," commented **Cliff Woodruff**, Associate Provost for Computing at Tulane University. "He has a flair for the graphics and user-friendliness of the computer. Whether he can get his workstation into a price range that universities can afford is the test. But I think he is right. That's where it's headed."

"A lot of people are discovering that the computer is a very powerful communications tool," observed **David P. Richtmann**, President of Participation Systems, a computer conferencing system company. "I think the third wave of computer users [communications] will be so much larger than the first two waves: the programmers and the end users of analytical packages."

"The biggest thing is that we still don't know a lot about the effect of personal computing on higher education over the next ten years," said **John Bardo**, Provost and Academic Vice President at the University of Florida. "There's a surprising degree of lack of knowledge, even five or six years after the computer revolution supposedly hit higher education."

"I now have a better realization of the way networking is going at the various institutions," admitted **J. Bradley Reese**, the Director of Academic Computing Services for Loyola College in Los Angeles. But Reese was more skeptical of Jobs' single-minded simulation thrust. "I think he is on *a* track, not *the* track. There are many. Simulated learning environments are just one of the many ways people learn. There are more traditional ways of learning, you know. I haven't given up on those," Reese asserted.

'People are now realizing that each institution can't go it alone.'

James B. Conklin, Jr., Director of the computational facility, Harvard-Smithsonian Observatory

"People are now realizing that each institution can't go it alone," observed **James B. Conklin, Jr.**, Director of the computational facility at the Harvard-Smithsonian Observatory. "The expense of generating software for courses is much too high for us to do independently. We need to share the resources. The commercial world has to do part of that sharing," Conklin pointed out.

Out of the Mouths of Neanderthals

Ross Saunders, Academic Associate Vice President at Simon Fraser University in British Columbia, wondered whether **Steve Jobs'** call for courseware would elicit much response from scholars who are working in narrow fields of interest.

"I'm by trade a linguist, and I don't think there's a universal market for it," he remarked forlornly. "There are maybe 200 students who would take my phonetics course . . . . It wouldn't be like what [Jobs] was talking about with his high-level graphics. In certain areas, such as physics, where you have well-defined algorithms for doing simulations, and where graphics are important, okay, but not in phonetics."

Saunders wants to find out whether the Neanderthal man had the same range of sounds available to him as modern man. "Because of the relationship of the pharynx to the vocal cavity, there's no right-angle bend there," Saunders explained. The prevailing theory is that Neanderthal didn't have the same range we have today, but Saunders would love to have a "simulation whereby you could manipulate the tongue to different parameters and see what you've got–see what is really possible."

The Courseware

At the various Educom corporate exhibits and at those on the University of Pittsburgh and Carnegie Mellon campuses was an array of interesting courseware, mostly still under development. The outstanding features were color and detail, but so far most courseware hasn't gotten very far past drill and practice. It is not as interactive and innovative as it soon will be, especially if the corporate bucks spill in.

The following are some of the courseware highlights that I saw:

At the IBM booth was the impressive *Murder, She Computed,* Cornell University's touch-screen video, interactive German-language instruction program. In it, a murder has already been committed and you try to find the murder weapon by searching through the various rooms of the house, learning German as you go. The program, created by Cornell's **Dr. Geri Gay**, who also directed the video work herself, runs under IBM's InfoWindows system.

The University of Southern California gets kudos for a pioneering interactive program that provides cancer education instruction for patients as well as their relatives and friends.

The Top Gun Award: Cornell University's *Fine Element Analysis, Realistic Image Synthesis* program. The synthesized fractal graphics are so real, they are frightening. With a paint brush, you can apply qualities such as copper, tin, and wood to surfaces. "A Johnson's Wax commercial," someone commented at the sight of a polished kitchen floor. We saw the program in the Digital booth running on a VAX.

Carnegie Mellon's *Great American History Machine* is an American census program. I tried to get an idea of the level of literacy in the U.S. during 1850, the only year that the program can handle so far.

Carnegie Mellon has a program in development that is currently on the Andrew network called *Notes,* which helps students take, store, and organize notes from many sources: on-line, electronic, or printed.

The university's Center for Art and Technology features Professor **Harry Holland**'s *Panda,* a versatile paint system that puts *MacPaint* to shame. It currently runs on the Digital LSI-11/03 and the IBM PC XT and AT. *Panda* offers a variety of brushes and a choice of 256 simultaneously displayable colors out of a possible 16.77 million combinations, and the colors can be remixed to create new colors. *Panda* is used in art, design, and architecture classes at Carnegie Mellon.

Kinko's Courseware

The following is a list of some of the more interesting Macintosh programs from Kinko's Academic Courseware Exchange (Fall 1986 catalog):

- *AppleTones* and *Mozart* (Dartmouth College). "*AppleTones* teaches the importance of repetition, silence, changes in volume, and timber in the composition and arrangement of music. *Mozart* lets students play musical dice games, experimenting with musical arrangement, tempo, articulation, and dynamics."
- *Huckel Molecular Orbitals* (Franklin and Marshall College) "calculates energy eigenvalues, eigenvectors, and pi-electron charge densities using the assumptions of simple Huckel molecular orbital theory."
- *Treaty of Versailles* (Drexel University) is "a series of exercises that teach the major territorial and reparation decision in the Treaty of Versailles. Uses questioning and interactive map exercises."

For more information about Kinko's software offerings, write or call Kinko's Academic Courseware Exchange, 4141 State St., Santa Barbara, CA 93110, 800/235-6919, in California 800/292-6640.

Journals and Newsletters

The quarterly *Educom Bulletin* covers items of special interest to academic policy makers and planners. Topics in 1985 and 1986 have included academic computer networking, next-generation PCs, merging libraries and computer centers, computer-intensive campuses, and the future of technology in education. First established in 1964, it is currently distributed to 12,000 readers.

The *Bulletin* is free for Educom member institutions and corporate associates and is $20 a year for non-members.

For more information, call or write Educom, P.O. Box 364, Princeton, NJ 08540, 609/734-1915.

Harvard's *Information Technology Quarterly* covers a wide range of topics of special interest to academics and others who need to keep informed of the basics in computers and information systems.

The quarterly is also publishing a hardcover book, *From Sand to Circuits and Other Inquiries,* a collection of the best articles from the *Quarterly.*

Subscriptions to the *Quarterly* are $15 for individuals and $25 for corporations. The book, due out this month, is $24.95.

Write or call Harvard University, Office of Information Technology, 1730 Cambridge St., Cambridge, MA 02138, 617/495-5633.

You philosophers out there might be interested in CMU's new *Computer and Philosophy Newsletter,* which focuses on the use of computers in teaching logic, ethics, and other subjects in philosophy. For information, write to CDEC, CMU Bldg. B, Pittsburgh, PA 15213.

Bitnet

Bitnet is an international academic communications network linking more than 900 computers at over 200 member institutions and research centers. It links up with NetNorth (Canada) and EARN (Europe), and has nodes in Mexico, Israel, Japan, and other parts of Asia. Members can exchange messages, mail, documents, programs, and data. Descriptions of successful academic projects using Bitnet abound, and the international transacademic possibilities are amazing. I heard about one scholar in the U.S. and another in Finland who did a joint research paper.

A Nobel Talk

Herbert Simon gave a brilliant analysis of the development of the computer revolution in his opening address, entitled "Why the Steam Engine was Revolutionary."

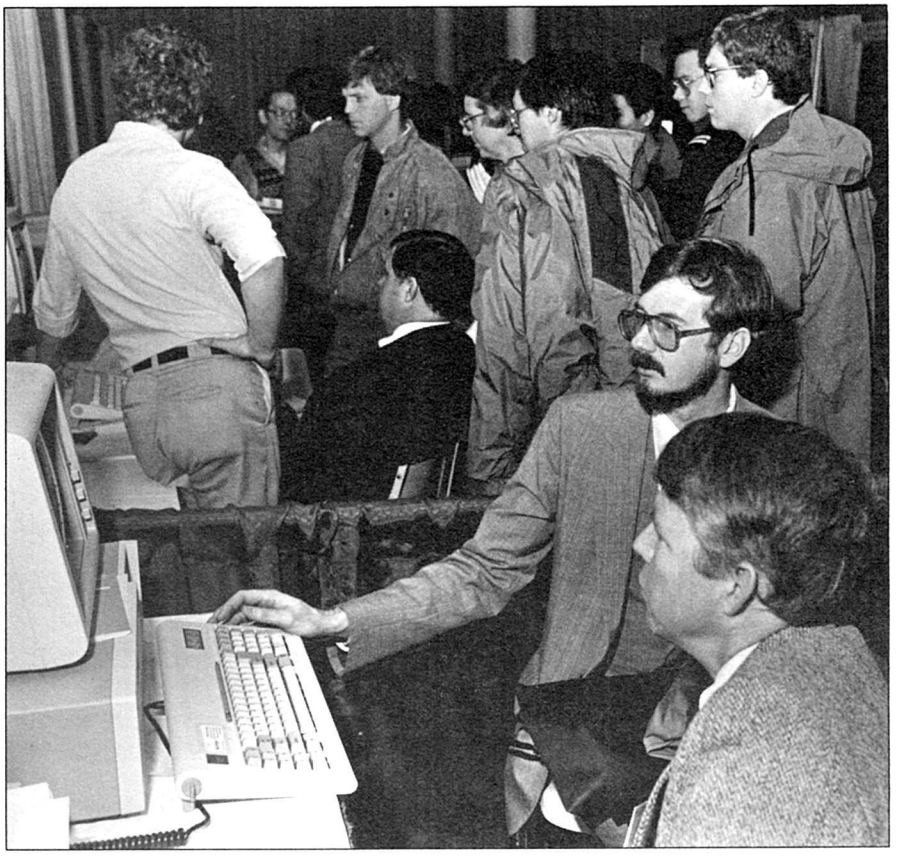
"I think the lesson to be learned," Simon noted, "is that a change in technology that's really going to reshape society–and I think the invention of the steam engine in time reshaped Western society and now the entire world–doesn't do it by itself, but through a lot of unanticipated consequences that require a host of additional, completely new inventions of essentially the same magnitude as the one which set it off in the first place."

I recommend that everyone in the computer industry order this $8 tape of Simon's speech and listen to it on the freeway, in the skies, in the office, or while you're jogging. In fact, Educom had every conference session taped. To order tapes, write or call Recorded Resources Corporation, 1468 Crofton Pkwy., Crofton, MD 21114, 301/858-0026.

Simon's New Book

Simon has an intriguing book due out this month, *The Rediscovery of Science*, in which he covers the results of a program he helped develop called *Bacon*. Simon fed in the identical data that was available to great historical scientists like **Johannes Kepler** and **Joseph Black** to see if "the program is capable of discovering the same or different law than the original discovery." The program generally came up with the same findings.

"What I concluded from this is that you don't have to postulate any kind of mysterious process, or fundamentally unknown processes, to account for things in human beings called creativity," Simon reported. "We can't establish creativity as the Iron Curtain which limits what computers can do."



Intuition, creativity, and all original thought will one day be general features of any enlightened computer. Have you hugged your PC today?

* * *

For more information about Educom's Software Initiative, general membership, Corporate Associates Program, Bitnet, or the Educom Consulting Group, write or call Educom, P.O. Box 364, Princeton, NJ 08540, 609/734-1915.

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